FY 2018

Integrated
Comments and Recommendations

on the MWRA's Proposed
Capital Improvement Program
and
Current Expense Budget

MWRA
Advisory Board

The Community Advisory Board to the Massachusetts Water Resources Authority

May 2017

The MWRA Advisory Board…

was established by the State Legislature to represent the 60 communities in the MWRA service area. Through annual comments and recommendations on the Authority's proposed capital and current expense budgets and rates, the Advisory Board provides a ratepayer perspective on the MWRA's plans and policies to improve the region's water and sewer systems.

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Integrated Comments and Recommendations

on the MWRA's Proposed

Fiscal Year 2018

Capital Improvement Program

and

Current Expense Budget

May 2017

Joseph E. Favaloro

Executive Director

Preface

Pursuant to its responsibility under Sections 8 and 23 of Chapter 372 of the Acts of 1984, the MWRA Advisory Board has undertaken a comprehensive review of the Authority's proposed Current Expense Budget and Capital Improvement Program and Budget for the fiscal year beginning July 1, 2017 (FY 2018). The Advisory Board's review has produced these *INTEGRATED COMMENTS AND RECOMMENDATIONS*, which state the Advisory Board's opinions on a number of issues and policies, plus recommendations on proposed spending in each MWRA department. These *Comments and Recommendations* were approved at the May 18, 2017 meeting of the full Advisory Board.

These *Comments and Recommendations* were prepared by Joseph Favaloro, Matthew Romero, James Guiod, and Lenna Ostrodka of the Advisory Board staff. Overall direction was provided by Vice Chairman for Finance, Bernard Cooper, with the participation of Advisory Board members.

All base information for figures and tables, schematics and photographs contained within the *Comments and Recommendations* document are provided by MWRA or their consultants, unless otherwise noted.

The Advisory Board extends its appreciation to MWRA staff for their assistance in reviewing the FY18 Capital and Current Expense Budgets.

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Table of Contents

Table of Tables

Table of Figures

Introduction

By statute the Advisory Board for MWRA communities is charged with reviewing the Massachusetts Water Resources Authority's proposed Capital Improvement Program (CIP) and proposed Current Expense Budget (CEB). Beginning in 2009, the Advisory Board consolidated its review into one *Integrated Comments and Recommendations* document.

The Authority's proposed FY18 rate revenue requirement combined increase is 3.79%, consistent with the Advisory Board's recent mantra of "Four No More." In fact, the Authority's current projections keep increases at 3.8% or below for the next ten years. The Advisory Board applauds the Authority for its continued efforts to maintain this level of increases as a starting point. Indeed, while "Four No More" was a good goal for the period – one characterized by ballooning debt payments, a race to fully fund the pension, and an OPEB liability that continued to grow and remained unfunded – the Advisory Board believes a corner is being turned this year. Building upon this year's recommendation, which will be the lowest wholesale rate increase in five years, we will begin searching for the next rates goal beyond "Four No More."

In its presentations to the Advisory Board, Authority staff characterized its approach to the Proposed FY18 CEB to be one of "managing uncertainty." Indeed, there is great uncertainty with regard to interest rates both on its debt and its investments, utility and chemical prices, as well as environmental regulations.

The Advisory Board's approach to this year's budget review mirrors the Authority's by reframing the issue as one of "managing risks." The Authority's proposed budget funds some of these areas of uncertainty and risk; however, the Advisory Board's assessment of the greatest areas of risk diverges from the MWRA's. With this in mind, we recommend reductions in areas where we believe the risk is less imminent, and redirect those funds toward areas of greater risk, in particular, the costs associated with the cross-harbor cable providing power to Deer Island. Despite redirecting some of these cuts, the Advisory Board continues its mission to reasonably and responsibly curtail community assessments, and is recommending a combined assessment increase of 3.19% for the final FY18 CEB, which will be the lowest increase in five years.

In the CIP, the Advisory Board has already taken official votes on two major CIP projects: Metropolitan Redundancy and the next phase of the Local Water System Assistance Program. This year's *Integrated C&R* will recap the Advisory Board's deliberations and reiterate the final positions voted.

Proposed FY18 Capital Improvement Program

Proposed FY18 CIP Highlights

- Currently open capital projects total nearly $7.3 billion (columns 2 plus 4)
- Nearly $4.0 billion has been spent on these projects through FY 2016 (column 2)
- A net total of $4.08 billion is treated as completed (and closed out) and removed from the open project list (column 1)
    - Most notable among these is $3.51 billion for the Boston Harbor Project[1]
- From the inception of the Authority in 1985 through FY 2016 capital spending totals $8.07 billion (column 3)

Table 1

Currently Active Projects and MWRA Spending Since 1985

($ millions)

Program	Completed (and closed out) Projects	Active Projects Spending through FY16	TOTAL SPENT 1985-2016	MWRA Future Spending	TOTAL (Spent and Future Spending)
Wastewater System Improvements	$3,884.9	$1,931	$5,816.2	$1,241.2	$7,057.4
Waterworks System Improvements	168.6	1,965	2,133.7	2,027.5	$4,161.2
Business & Operations Support	31.3	93	124.0	38.8	$162.8
TOTAL MWRA (w/o Contingency)	**$4,084.9**	**$3,989.0**	**$8,073.9**	**$3,307.4**	**$11,381.4**

- Future project spending of just over $3.3 billion is proposed (column 4)
- Total spending, both past and future (as identified to date in the proposed CIP) is just under $11.4 billion (column 5)
- Each year, the Authority includes new projects, as identified in the Master Plan, although not all projects in the Master Plan are in the annual budget document
- The Master Plan, published first in 2006, identified and prioritized $3.1 billion in water and wastewater projects:
    - FY 2007 – 2018 (12 years): nearly $2.034 billion in project needs were identified (66% of the total)
    - FY 2019 – 2048 (30 years): $1.044 billion in future project needs were identified
- The Master Plan was updated in September 2013 with a 40-year look at potential capital expenditures to 2053. The updated Plan identifies (approximately):
    - Wastewater needs: $2.5 billion
    - Waterworks system needs: $1.5 billion
    - Updated total: $4.0 billion
        - FY14-33: $2.0 billion
        - For consideration in future capital budgets: $2.0 billion
        - Updated Master Plan is available at www.mwra.com

Shift from Mandated Spending to Asset Protection

- Nearly 80% of all spending since 1985 has been for court-mandated projects or major new facilities, including:
    - Deer Island Wastewater Treatment Plant/Boston Harbor Project: $3.51 billion
    - Residuals facilities at Fore River/Quincy: $64.6 million
    - CSO Control Program: $893.5 million through FY 2016

[1] On Deer Island. Including spending on residuals processing facilities, the Boston Harbor Project total is $3.8 billion.

   - MetroWest Water Supply Tunnel: $697.0 million through FY 2016
- Carroll Water Treatment Plant: $418.8 million through FY 2016
- Going forward, the Authority's focus is on Water and Wastewater Asset Protection and on Water System Redundancy projects
- Asset Protection and Water Redundancy spending more than doubles from nearly $437.2 million during the FY14-18 period to over $1.2 billion during FY19-23
- CSO Control Program has reached substantial completion (December 2015)
   - Program budget totals $909.5 million[2]
   - FY17-18 spending: $10.5 million
   - Spending going forward will be for ongoing monitoring
- Negative spending beyond FY 2018 reflects repayments of the loan portions of the community assistance programs

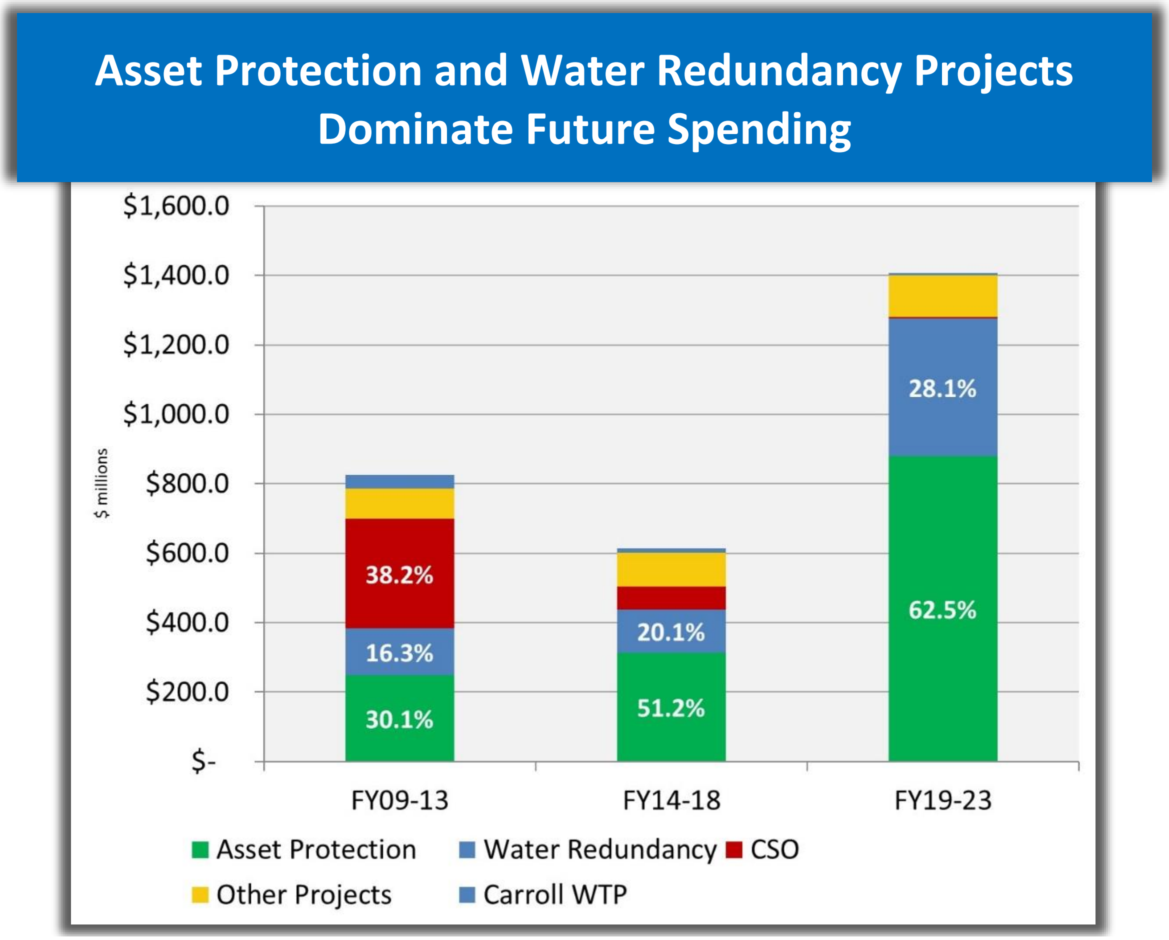

Figure 1

[2] Since updated.

Table 2

Capital Spending by Initiative[3] $ millions					
	Total Contract	**FY09-13**	**FY14-18**	**FY19-23**	**Beyond FY23**
Asset Protection	$2,470.8	$248.0	$314.0	$879.4	$394.0
Water Redundancy	2,874.1	134.7	123.2	395.7	1,359.1
CSO	884.9	315.5	66.2	5.6	-
Carroll WTP	439.0	38.5	12.3	5.1	10.4
Other Projects	627.7	88.4	97.7	120.5	-174.7
Total	**$7,296.5**	**$825.1**	**$613.3**	**$1,406.3**	**$1,588.8**
Asset Protection	33.9%	30.1%	51.2%	62.5%	24.8%
Water Redundancy	39.4%	16.3%	20.1%	28.1%	85.5%
CSO	12.1%	38.2%	10.8%	0.4%	0.0%
Carroll WTP	6.0%	4.7%	2.0%	0.4%	0.7%
Other Projects	8.6%	10.7%	15.9%	8.6%	-11.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

[3] Source: MWRA, Proposed FY18 CIP, page 16

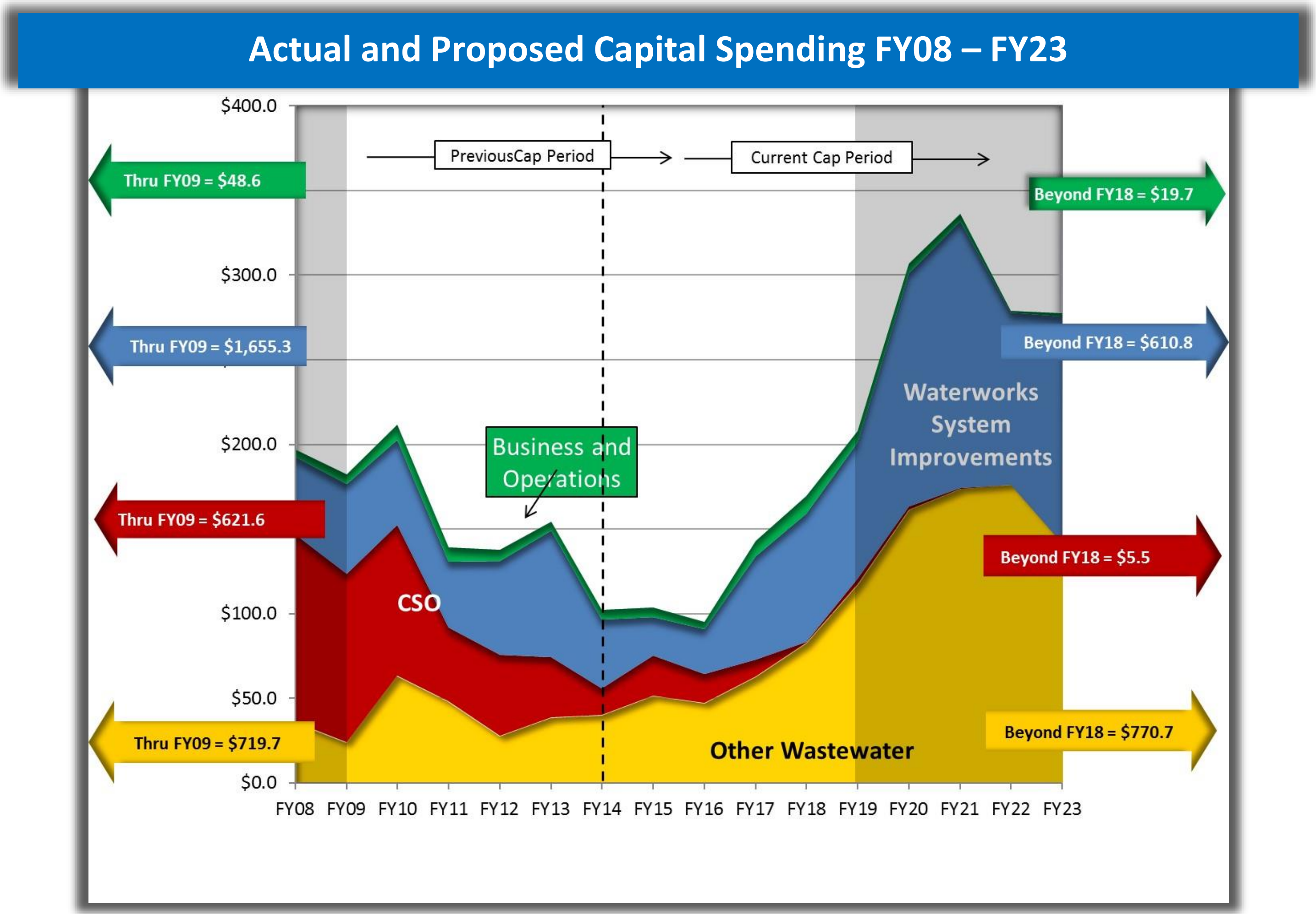

Figure 2

Changes in Proposed Spending for FY14-18

Table 3

FY14-18 Capital Spending by Program

($ millions)

Program	Total Contract	Spending thru FY16	Remaining Balance	FY14 Actual	FY15 Actual	FY16 Actual	FY17 Projected	FY18 Proposed	FY14-18
Wastewater System Improvements	$3,172.5	$1,931.3	$1,241.2	$55.7	$75.4	$64.2	$73.1	$83.2	$351.5
Interception & Pumping	980.6	542.6	438.0	6.9	8.6	6.6	21.5	36.7	80.3
Treatment	871.8	266.8	605.0	29.1	25.7	27.3	22.5	24.4	128.9
Residuals	167.6	64.6	103.0	0.1	0.0	0.0	0.0	2.8	2.9
CSO	909.5	893.5	16.0	15.6	23.6	16.7	10.2	0.2	66.2
Other	242.9	163.7	79.2	4.0	17.5	13.6	18.8	19.0	73.1
Waterworks System Improvements	3,992.5	1,965.1	2,027.5	41.0	22.7	26.7	61.0	76.1	227.5
Drinking Water Quality Improvements	666.0	644.9	20.2	30.2	12.4	7.1	1.6	4.0	55.3
Transmission	2,451.7	770.6	1,681.1	4.5	2.5	8.1	28.2	24.5	68.3
Distribution and Pumping	805.5	400.9	404.6	4.8	8.9	15.0	23.5	37.6	89.3
Other	69.4	148.6	-79.2	1.5	-1.1	-3.4	7.7	10.1	14.7
Business & Operations Support	131.5	92.7	38.8	5.5	5.5	4.2	8.8	10.2	34.2
TOTAL MWRA w/o CONTINGENCY	$7,296.5	$3,989.0	$3,307.4	$102.2	$103.6	$95.1	$142.9	$169.5	$613.3

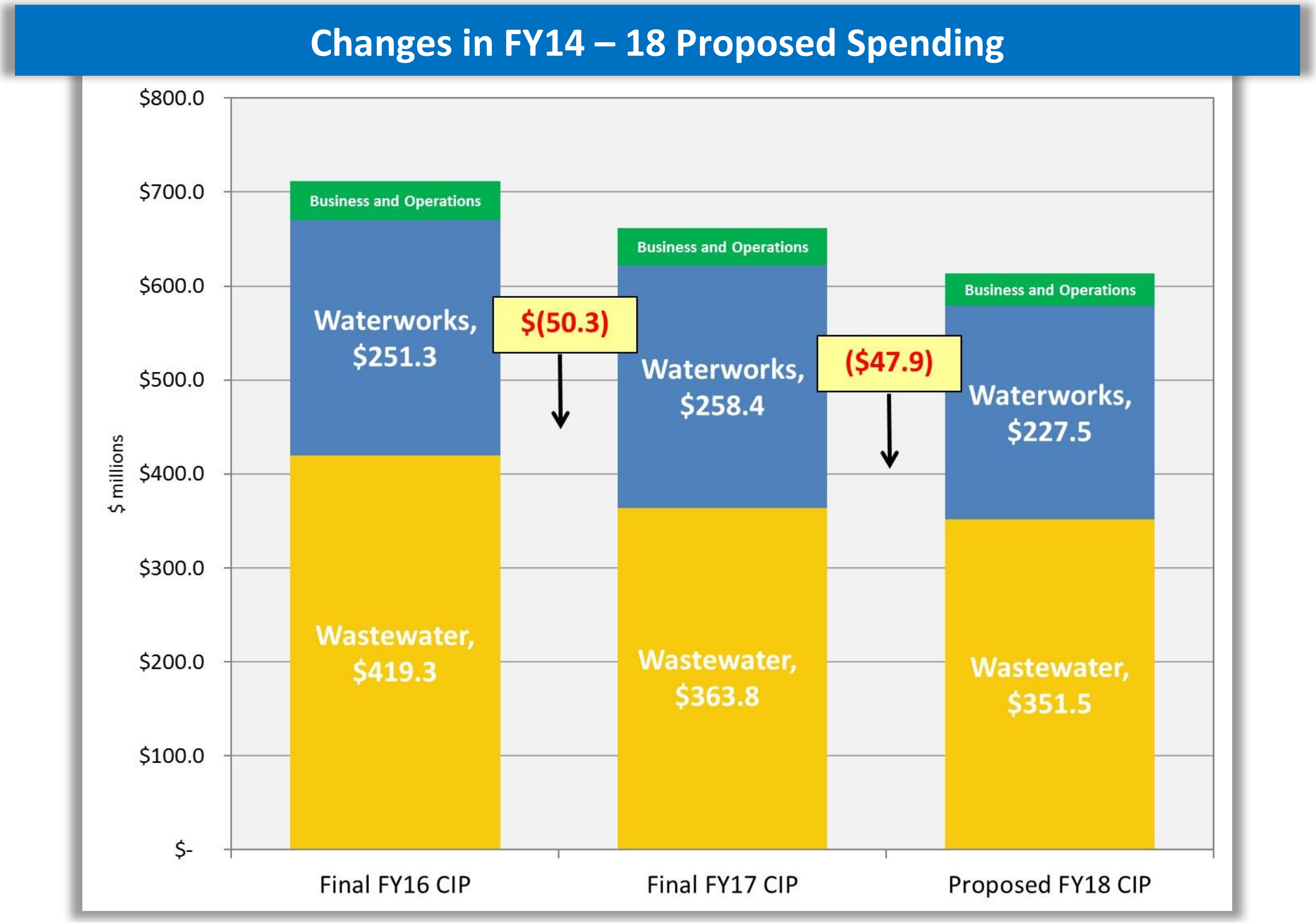

Figure 3

- Final FY16 capital spending cap (actual spending plus budgeted and projected spending) totaled $689.1 million
- Final FY17 spending level for the cap period was revised to $618.7 million, a reduction of over $70 million
- The proposed FY18 CIP spending for the five-year cap period is further revised downward to $550.8 million, an additional reduction of nearly $68 million. The reductions reflect slower and later assumptions for the pace of spending.
- The overall reduction from the FY14-18 base-line cap is $240.9 million
- FY14-18 wastewater spending as of the proposed FY18 CIP: $351.5 million
    - Represents 57% of total spending for the period
- FY14-18 waterworks spending: $227.5 million
    - Another $11.9 million lower than assumed in the proposed FY17 CIP
    - Represents 37% of total spending for the five-year period

FY17-18 Capital Spending

Table 4

Largest 10 Projects FY17-18 ($ millions)				
Utility	**Program**	**Project**	**FY17-18 Spending**	**% of Total CIP FY17-18 Spending**
Wastewater	Interception & Pumping	145 Facility Asset Protection	$55.51	17.8%
Wastewater	Treatment	206 DI Treatment Pl Asset Protection	38.47	12.3%
Wastewater	Other	128 I/I Local Financial Assistance	37.89	12.1%
Waterworks	Transmission	622 Cosgrove Tunnel Redundancy	38.28	12.3%
Waterworks	Distribution & Pumping	722 NIH Redundancy & Storage	29.88	9.6%
Waterworks	Distribution & Pumping	727 SEH Redundancy & Storage	19.83	6.3%
Waterworks	Other	765 Local Water System Assistance Program	10.74	3.4%
Wastewater	CSO Community Managed	346 Cambridge Sewer Separation	8.58	2.7%
Wastewater	Treatment	210 Clinton Wastewater Treatment Plant	8.37	2.7%
Business and Operations	Business and Operations	881 Equipment Purchase	4.93	1.6%
Top 10 Spending in FY17-18			$252.5	80.8%
Total MWRA FY17-18 Spending			$312.4	100.0%

- Proposed and projected spending for actual and projected spending for FY14, 15, 16, 17, and 18 have declined from the previous year's proposed CIP spending while FY19 (outside the current cap period) spending increased
- Just over one-quarter (27%) of all spending in the FY14-18 cap period is now planned for FY18

Wastewater Capital Spending

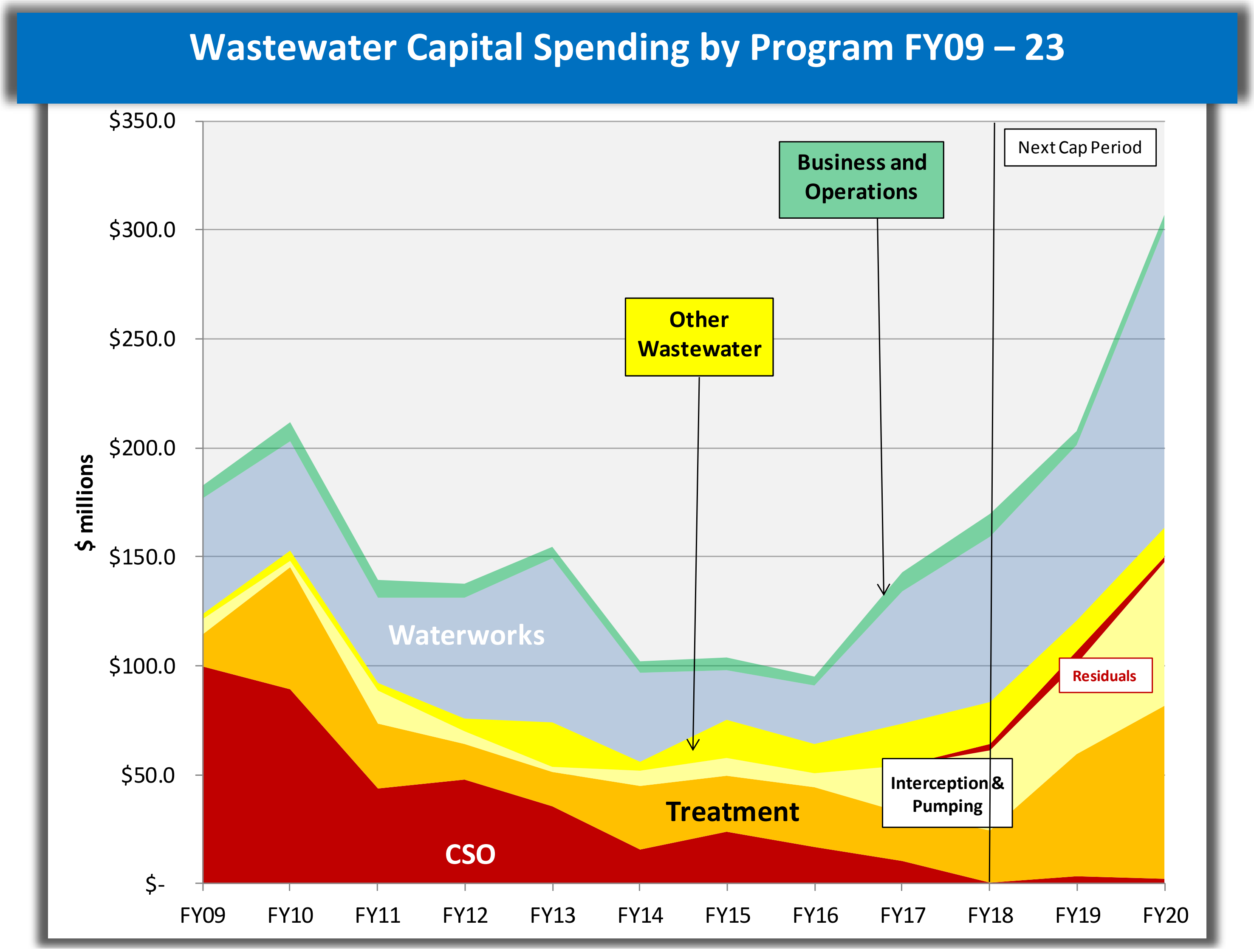

Figure 4

- Wastewater system improvement projects are divided into five categories:
    1. Interception and Pumping projects
    2. Treatment projects (Deer Island and Clinton wastewater treatment plants)
    3. Residuals
    4. Combined Sewer Overflow Program projects
    5. Other (including the I/I Local Financial Assistance program)

Wastewater Spending Highlights

- FY18 spending on wastewater projects is proposed at $83.2 million or 49% of all capital spending proposed for the year
- Together, wastewater capital spending is expected to be 57.3% of all spending for the FY14-18 cap period

- Ten wastewater projects account for nearly all wastewater spending during FY17-18; the largest are:

Table 5

Proposed FY17-18 CIP Largest 10 Wastewater Projects ($ millions)				
Utility	**Program**	**Project**	**FY17-18 Spending**	**% of Total Wastewater FY17-18 Spending**
Wastewater	Interception & Pumping	145 Facility Asset Protection	$55.51	35.5%
Wastewater	Treatment	206 DI Treatment Pl Asset Protection	38.47	24.6%
Wastewater	Other	128 I/I Local Financial Assistance	37.89	24.2%
Wastewater	CSO Community Managed	346 Cambridge Sewer Separation	8.58	5.5%
Wastewater	Treatment	210 Clinton Wastewater Treatment Plant	8.37	5.4%
Wastewater	Residuals	271 Residuals Asset Protection	2.84	1.8%
Wastewater	Interception & Pumping	132 Corrosion & Odor Control	1.63	1.0%
Wastewater	CSO Planning & Support	324 CSO Support	1.62	1.0%
Wastewater	Interception & Pumping	142 Wastewater Meter System - Equipment Replace.	0.51	0.3%
Wastewater	Interception & Pumping	137 Wastewater Central Monitoring	0.36	0.2%
Top 10 Wastewater Spending in FY17-18			**$155.76**	**99.7%**
FY17-18 Wastewater Spending			**$156.26**	**100.0%**

- New wastewater projects proposed for the FY18 budget:

Table 6

New Wastewater Projects Proposed in FY18			
Program	**Project | Subphase**	**FY18 Spending**	**Beyond FY18**
Interception & Pumping	Corrosion & Odor Control | Nut Island Headworks Odor Control and HVAC Improvements Construction		$10,000,000
Interception & Pumping	Facility Asset Protection | Fuel Oil Tank Replacements at Various Facilities Design CA/RI	286,614	1,241,991
Interception & Pumping	Facility Asset Protection | Fuel Oil Tank Replacements at Various Facilities Construction Phase 1		3,566,745
Interception & Pumping	Facility Asset Protection | Fuel Oil Tank Replacements at Various Facilities Construction Phase 2		2,547,675
Interception & Pumping	Facility Asset Protection | Headworks Effluent Shaft Rehabilitation Design CA/RI		2,038,140
Interception & Pumping	Facility Asset Protection | Headworks Effluent Shaft Rehabilitation Construction		10,190,700
Interception & Pumping	Facility Asset Protection | Wiggins Terminal Pump Station Replacement Design CA/RI	80,955	427,900
Interception & Pumping	Facility Asset Protection | Wiggins Terminal Pump Station Replacement Construction		2,035,420
Treatment	DITP Asset | Fixed Gas Protection Systems Replacement	166,667	1,833,333
Residuals	Residuals Asset Protection | Residuals Pellet Conveyance Piping	166,667	2,833,333

Interception and Pumping (I&P) Projects

- Includes projects that address the wastewater collection system facilities, sewers and tunnels. Among them are:
  - Four remote headworks facilities
  - Twenty pump stations and CSO facilities
  - More than 250 miles of sewer pipes
  - Four cross harbor tunnels to the Deer Island plant totaling 18 miles
- Proposed FY17 -18 spending: $58.2 million
- Total projected cap spending: $80.3 million
- Wastewater Facility Asset Protection is the largest group of contracts in the I&P projects category
  - FY17-18 spending: $55.5 million
    - This is over 95% of all I&P spending for the two-year period
  - Total future spending is $331.6 million (from FY18 going forward)
    - $241 million of this amount is scheduled for the next cap period (FY19-23)
  - Wastewater Facility Asset Protection has over 70 subphases (contracts)
    - 6 contracts make up 82.4% of FY17-18 spending
    - 8 contracts make up 83.9% of FY14-18 spending

Table 7

Largest I&P Facility Asset Protection Contracts		
Subphase	**FY17-18 Spending**	**FY14-18 Spending**
Chelsea Creek Upgrades - Construction	$22.77	$22.77
Alewife Brook Pump Station Rehab - Construction	12.61	12.61
Caruso Pump Station Improvements - Construction	3.91	4.48
Interceptor Renewal 1, Reading Extension - Construction	3.60	3.60
Chelsea Screenhouse Upgrades	1.66	5.04
Chelsea Creek Upgrades - Design/CA	1.19	4.38
Prison Point/Cottage Farm Pump & Gearbox Rebuilds		6.44
NI Electrical & Grit/Sreenings Conveyance System - Construction		5.19
Total	**$45.74**	**$64.51**
% of Facility and Asset Protection Spending	**82.4%**	**83.9%**

- Other I&P projects with measurable future spending after the current cap period include:
  - Corrosion and Odor Control (several contracts, $22.9 million)
  - Wastewater Meter Equipment Replacement ($8.20 million during the next cap period)
  - Wastewater Central Monitoring including SCADA/PLC Upgrades ($7.3 million)
  - Braintree-Weymouth Improvements ($6.5 million)
  - Siphon Structure Rehabilitation construction ($5.9 million)
  - Deer Island Cross Harbor Tunnel ($5.0 million)
  - Randolph Trunk Sewer Relief Study ($0.75 million)

Table 8

Chelsea Creek Headworks

All three remote headworks were built in 1967 and upgraded in 1987. All three facilities operate 24 hours per day.

Chelsea Creek Headworks in located in Chelsea and has an average daily flow of 135 mgd. It serves 16 north system communities.

Contracts	Before FY16	FY16	FY17	FY18	FY19-FY23	FY24-Beyond FY26	Totals
Headworks	**$4,691,564**	**$768,248**	**$5,544,011**	**$19,708,156**	**$54,577,641**	**$0**	**$85,289,620**
Chelsea Creek Upgr Design/CA	4,691,564	693,492	544,438	649,775	2,111,766	0	**$8,691,035**
Chelsea Creek Upgrades REI	0	74,756	419,172	838,345	2,375,312	0	**$3,707,585**
Chelsea Hdwk-Caruso PS Utility	0	0	26,714	5,286	0	0	**$32,000**
Chelsea Creek Upgr Construction	0	0	4,553,687	18,214,750	50,090,563	0	**$72,859,000**
Totals	**$4,691,564**	**$768,248**	**$5,544,011**	**$19,708,156**	**$54,577,641**	**$0**	**$85,289,620**

Previous Spending Summary	Current Cap Spending Summary	Future Spending Summary
	The contact for upgrade construction work is out for bid, spring 2016. Spending will continue into the next cap period.	

Table 9

Columbus Park & Ward Street							
Preliminary design report proposes replacements/upgrades to the screens, grit and screening collection and conveyance systems, odor control, HVAC, mechanical, plumbing, instrumentation, PCB removal, electrical systems, and antenna towers. Final design and construction contracts for the Columbus Park (in South Boston; 40 mgd) and Ward Street Headworks (upstream of Columbus Park and also located in Boston; 90 mgd) are to follow work on the Chelsea Creek Headworks and will reflect lessons from first project.							
Contracts	**Before FY16**	**FY16**	**FY17**	**FY18**	**FY19-FY23**	**FY24-Beyond FY26**	**Totals**
Columbus Park Headworks Construction	$0	$0	$0	$0	$0	$0	**$0**
Columbus Park&Ward St. HVAC Upgrades	0	0	0	0	0	0	**$0**
Ward St & Colu Park HWKS Des/CA/REI	0	0	0	0	6,583,519	3,927,013	**$10,510,532**
Ward St & Columbus Park HWKS Const	0	0	0	0	62,227,586	40,836,854	**$103,064,440**
Totals	**$0**	**$0**	**$0**	**$0**	**$68,811,105**	**$44,763,867**	**$113,574,972**
Previous Spending Summary		**Current Cap Spending Summary**			**Future Spending Summary**		
					Construction to start August 2022.		

Table 10

Cottage Farm							
The Cottage Farm CSO facility was constructed in 1971, and is located next to Magazine Beach on the Cambridge side of the Charles River.							
Contracts	**Before FY16**	**FY16**	**FY17**	**FY18**	**FY19-FY23**	**FY24-Beyond FY26**	**Totals**
CF PCB Abatement Design/CA	$0	$0	$0	$0	$0	$0	**$0**
CF Rehab Design/CA/REI	0	0	0	0	1,511,082	503,694	**$2,014,776**
Cottage Farm Construction 1 (PCB)	0	0	0	0	0	0	**$0**
Cottage Farm Fuel System Upgrade	497,558	0	0	0	0	0	**$497,558**
Cottage Farm Rehab Const	0	0	0	0	8,814,645	1,259,235	**$10,073,880**
P/P & C/F Washdown Sys Pipe - Design	0	0	0	0	0	0	**$0**
PP/CF Engine Pumps Gearbox	6,150,773	444,358	0	0	0	0	**$6,595,131**
Prison PT/CF GB Pump/ESDC	261,671	69,291	-87,526	0	0	0	**$243,436**
Totals	**$6,910,002**	**$513,649**	**-$87,526**	**$0**	**$10,325,727**	**$1,762,929**	**$19,424,781**
Previous Spending Summary		**Current Cap Spending Summary**			**Future Spending Summary**		
		The engine, pumps, and gearbox project reached substantial completion in fall 2015.			Construction of rehabilitation and facility improvements to start July 2021.		

Table 11

Prison Point							
The Prison Point CSO facility was constructed in 1978 and has a maximum capacity of 323 mgd. It is located off Route 28 and Land Boulevard in Cambridge near the museum of Science.							
Contracts	**Before FY16**	**FY16**	**FY17**	**FY18**	**FY19-FY23**	**FY24-Beyond FY26**	**Totals**
P/P & C/F Washdown Sys Pipe - Design	$0	$0	$0	$0	$0	$0	**$0**
PP Dry Weather Flow&Strip Pump Improv	0	0	0	0	0	0	**$0**
PP/CF Engine Pumps Gearbox	6,150,773	444,358	0	0	0	0	**$6,595,131**
Prison Point Des/CA/RI	0	0	459,757	559,674	1,818,939	0	**$2,838,370**
Prison Point HVAC Upgrades - Design	441,387	0	0	0	0	0	**$441,387**
Prison Point Piping Rehab	0	156,720	466,200	0	0	0	**$622,920**
Prison Point Rehab - Const	0	0	0	0	5,822,752	0	**$5,822,752**
Prison PT/CF GB Pump/ESDC	261,671	69,291	-87,526	0	0	0	**$243,436**
Totals	**$6,853,831**	**$670,369**	**$838,431**	**$559,674**	**$7,641,691**	**$0**	**$16,563,996**
Previous Spending Summary		**Current Cap Spending Summary**			**Future Spending Summary**		
Affected by $21 million project completed in 2001 which upgraded chlorine disinfection systems, added dechlorination systems, process control and safety improvements at five CSO facilities. $50,000 facility optimization project completed in 2008 reduced treated CSO discharges into the Upper Inner Harbor.		The engine, pumps, and gearbox project is substantially complete as of Fall 2015.			Prison Point rehabilitation work involves improvement/installations of systems for flood control and energy efficiencies. Security and fire alarm to be included		

Table 12

Alewife Brook Pump Station

The Alewife Brook Pump Station was built in 1951 in Somerville. Alewife receives wastewater from portions of Arlington, Belmont, Cambridge, Medford, and Somerville; all flow is conveyed to Deer Island for treatment. The project will improve pumping capacity and will incorporate preventative measures for climate change. The rehabilitation will include replacing the three original wet weather pumps, motors, and piping, replacing the influent screens and grinders, updating the HVAC system, upgrading the electrical system, remediating PCB-containing paints, and modifying the building interior to meet current building codes, energy efficiency improvements, flood protection measures, and security improvements.

Contracts	Before FY16	FY16	FY17	FY18	FY19-FY23	FY24-Beyond FY26	Totals
Alewife Brook PS Final Des/CA/REI	$915,501	$182,757	$243,698	$248,672	$290,117	$0	**$1,880,745**
Alewife Brook Pump Stn Rehab - Const.	0	2,059,945	6,818,032	5,794,968	0	0	**14,672,945**
Alewife Brook Pump Stn Rehab - Des/CA	223,194	0	0	0	0	0	**223,194**
Alewife Brook Pump Stn Screens-Const	0	0	0	0	0	0	**0**
Totals	**$1,138,695**	**$2,242,702**	**$7,061,730**	**$6,043,640**	**$290,117**	**$0**	**$16,776,884**

Previous Spending Summary	Current Cap Spending Summary	Future Spending Summary
Alewife Brook PS Final Des/CA/REI 50.5% complete.		No projected spending on the project after FY20.

Wastewater Treatment

- Deer Island Treatment Plant Asset Protection
- Clinton Wastewater Treatment Plant
- Laboratory Instrumentation (see Equipment Purchase project under Business and Operations Support)

Deer Island Wastewater Treatment Plant

- Deer Island Asset Protection appears to be the largest capital project in the next two years, but is actually made up of several large "sub-projects," the largest of which are shown in Table 14, Table 15, Table 16, and Table 17 below
- Spending in FY17-18 is budgeted at $38.5 million or 12.3% of all capital spending
- Total project costs increased by $42.2 million in the proposed FY18 budget (as compared to the final FY17 budget), from $772.6 million to $814.9 million

Table 13

Top Deer Island Projects by Period ($ millions)			
FY14-18			
Suphase	*$*		
Scum Skimmer Replacement	$	20.39	
NMPS VFD Replacement - Constructio	$	17.91	
NMPS & WTF Butterfly Valve Replace.	$	17.49	
Electrical Equipment Upgrades - Cons	$	7.87	
HVAC Equipment Replacement - Const	$	4.98	
Power System Improvements - Constr	$	4.75	
WTF VFD Replacement - Construction	$	4.11	81.0% of total spending
Centrifuge Backdrive Replacement	$	3.64	
Cryogenics Chillers Replacement	$	3.24	
Digested Sludge Pump Replacement -	$	2.59	
NMPS and WTF Valve & Piping Replace	$	2.32	
Secondary Reactor VFDs	$	2.30	
Sodium Hypochlorite&Bisulfite Tanks	$	2.00	
All (24) other contracts	$	22.01	
TOTAL	**$**	**115.62**	
FY19-23			
Suphase	*$*		
Clarifier Rehab Phase 2 - Constructior	$	80.00	
Combined Heat & Power - Constructic	$	32.85	
HVAC Equipment Replacement - Const	$	24.52	
Fire Alarm System Replacement - Con:	$	20.00	
Digester & Storage Tank Rehab - Cons	$	19.29	
Future SSPS VFD Replacements - Cons	$	19.20	
DI Centrifuge Replacements - Constru	$	16.64	
Gravity Thickener Rehab	$	14.50	
Electrical Equipment Upgrades - Phas	$	14.28	
NMPS Motor Control Ctr Phase 2 - Con	$	10.59	81.9% of total spending
Odor Control Rehab - Construction	$	8.92	
Deer Island As-needed Technical Desi	$	8.90	
PICS Distributed Process Units Replac	$	8.00	
WTF VFD Replacement - Construction	$	7.83	
Switchgear Replacement - Constructi	$	7.33	
DI Combustion Turbine Generator Rel	$	7.11	
Cathodic Protection - Construction	$	6.47	
DI PICS Replacement - Construction	$	5.40	
Cryogenics Plant Equipment Replacer	$	5.30	
Co-Digestion Design/Build	$	5.00	
All (35) other contracts	$	71.07	
TOTAL	**$**	**393.20**	

Table 14

Electrical Equipment Upgrade

This phased program, to replace bus ducts and substation components, has been ongoing since 2001, with future spending estimates included into the mid 2020's.

Contracts	Before FY16	FY16	FY17	FY18	FY19-FY23	FY24-Beyond FY26	Totals
Electrical Equipment Upgrade-Const 2	$1,913,183	$0	$0	$0	$0	$0	**$1,913,183**
Electrical Equipment Upgrade 3 - REI	1,111,984	0	0	0	0	0	**$1,111,984**
Electrical Equipment Upgrade-Const. 3	15,173,750	0	0	0	0	0	**$15,173,750**
Electr Equip Upgr 4 REI	310,790	284,327	93,084	0	0	0	**$688,201**
Electrical Equipment Upgrade-Const 4	6,148,522	3,752,802	677,365	0	0	0	**$10,578,689**
Electrical Equipment Upgrade Phase 5	0	0	0	0	14,283,156	8,878,719	**$23,161,875**
Totals	**$24,658,229**	**$4,037,129**	**$770,449**	**$0**	**$14,283,156**	**$8,878,719**	**$52,627,682**

Previous Spending Summary	Current Cap Spending Summary	Future Spending Summary
Many substations and individual components distribute power to all of the facilities on Deer Island. The components include transformers, load break switches, bus ducts, cables, conduit, motor control centers, and protective relaying systems. Four upgrade contracts have been approved over the last 15 years.	Electrical Equipment Upgrade Phase 4 (a 3-year contract), is ongoing and nearing completion. Related Utilities contracts also address transformer replacements, switchgear replacements, power system improvements, and VFD replacements.	Phase 5 construction is budgeted to begin December 2018 and continue through June 2026. The scope will reflect lessons learned from the previous contracts.

Table 15

Combined Heat & Power

The project is to optimize the use of methane gas produced from the existing sludge processing system. A new combined heat and power facility would combine gas-fired turbines, and would increase electrical production and self-generation.

Contracts	Before FY16	FY16	FY17	FY18	FY19-FY23	FY24-Beyond FY26	Totals
Combined Heat & Power Design	$0	$0	$168,750	$506,250	$0	$0	**$675,000**
Combined Heat & Power Constr	0	0	0	0	32,854,167	50,145,833	**$83,000,000**
Totals	**$0**	**$0**	**$168,750**	**$506,250**	**$32,854,167**	**$50,145,833**	**$83,675,000**

Previous Spending Summary	Current Cap Spending Summary	Future Spending Summary
	Design work is scheduled to begin Spring 2016; scope is being reviewed and can be expected to be extended.	Construction is scheduled to begin June 2018. One of the largest contracts in the Deer Island budget, it is budgeted over a four-year period to June 2022. Schedule may be extended to reflect revised time frame for feasibility study and preliminary and final design work.

Table 16

HVAC Equipment Replacement

The project will involve replacement of two obsolete HVAC control systems with one manufacturer's system, reducing replacement parts and improving automation. Includes replacement of fume hoods in the laboratory.

Contracts	Before FY16	FY16	FY17	FY18	FY19-FY23	FY24-Beyond FY26	Totals
HVAC Equipment Replacement - Const.	$0	$0	$0	$4,978,125	$24,521,875	$0	**$29,500,000**
HVAC Equipment Replacement - Des/ESDC	528,501	466,397	401	127,888	657,609	0	**$1,780,796**
Totals	**$528,501**	**$466,397**	**$401**	**$5,106,013**	**$25,179,484**	**$0**	**$31,280,796**

Previous Spending Summary	Current Cap Spending Summary	Future Spending Summary
Design contract was awarded in the spring 2014.	Schedule for construction contract of $25 million now being revised for a January 2017 NTP. Cost estimates are expected to increase by $4.5 million to $29.5 million.	Contraction contract substantial completion is currently scheduled for October 2019; maybe extended by 1 year. Construction costs continue to be updated and increased.

Table 17

Fire Alarm System Replacement

The project includes the replacement of the existing fire alarm system at Deer Island; including the front end, graphical panels, and all field devices. It may also include the replacement of the existing fiber optic data highway, based on an assessment to be conducted by the design consultant. It is one of the largest fire alarm systems in New England.

Contracts	Before FY16	FY16	FY17	FY18	FY19-FY23	FY24-Beyond FY26	Totals
Fire Alarm System Replacement-Design	$0	$173,231	$533,079	$309,204	$1,063,837	$0	**$2,079,351**
Fire Systm Repl REI	0	0	0	0	1,800,000	0	**$1,800,000**
Fire Alarm System Replacement - Const	0	0	0	0	20,000,000	0	**$20,000,000**
Totals	**$0**	**$173,231**	**$533,079**	**$309,204**	**$22,863,837**	**$0**	**$23,879,351**

Previous Spending Summary	Current Cap Spending Summary	Future Spending Summary
	The Board awarded a design contract in October 2015 which includes preliminary design, final design, and engineering services during construction.	The construction contract is budgeted to run from February 2018 to August 2021; the system is estimated for replacement every 20 years.

Deer Island Treatment Plant versus Clinton Treatment Plant Spending FY14-18

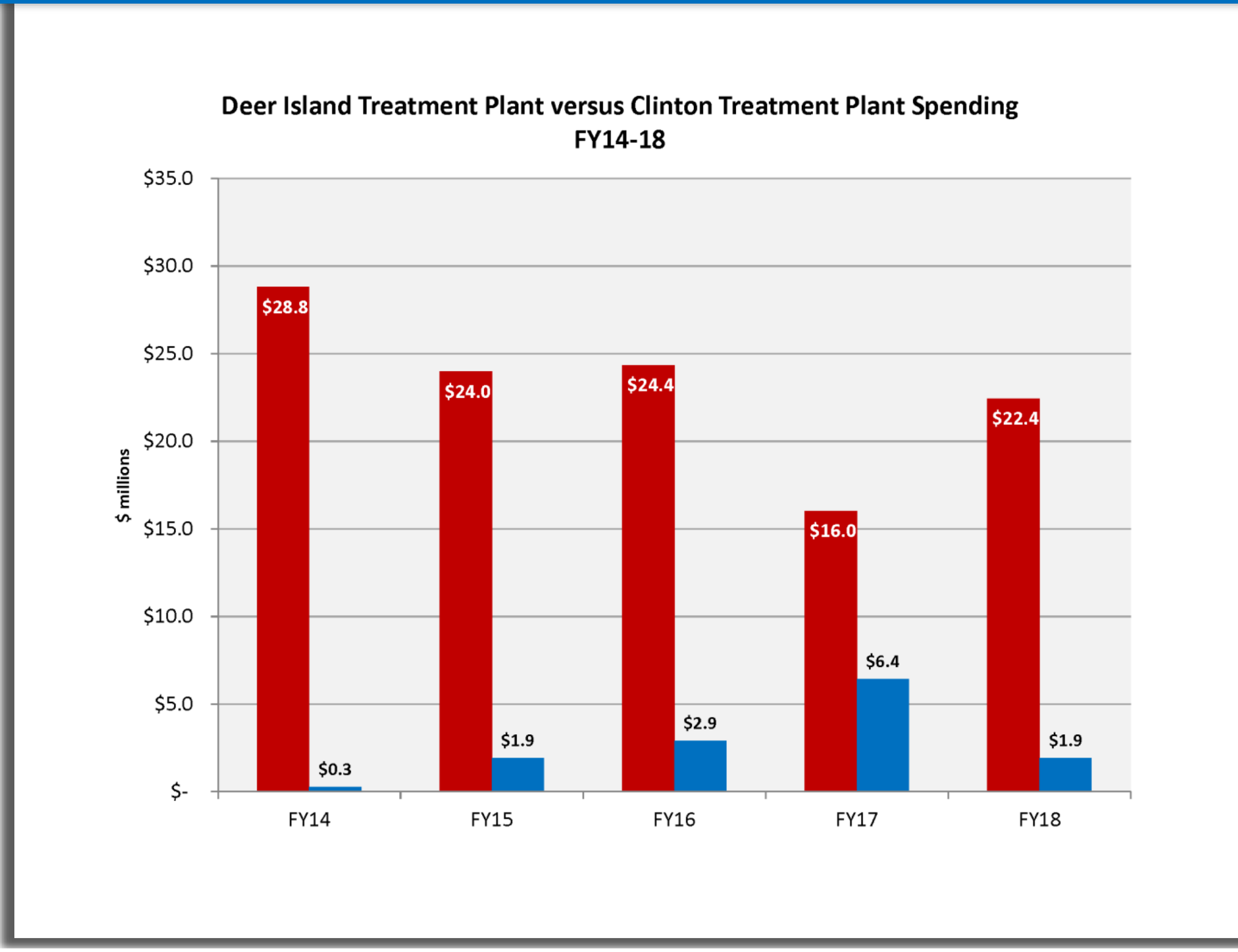

Figure 5

Clinton Wastewater Treatment Plant

- Total project costs increased by $1.9 million from $20.5 million to $22.4 million
- Spending during FY17-18: $8.4 million
  - Phosphorus removal construction FY17-18 spending: $6.6 million
    - This is 78.8% of FY17-18 spending
- Spending from FY14-18: $13.5 million
  - Phosphorus removal construction FY14-18 spending: $7.5 million
- Spending from FY19-23: $5.83 million

Table 18

Clinton Wastewater Treatment Plant ($ millions)			
Projects	FY 09-13	FY14-18	Beyond 18
Clinton Soda Ash Replacement	$0.15		
Clinton Plant-Wide Concrete Repair	0.06		
Clinton Digester Cleaning and Rehab	0.09	3.35	
Clinton Aeration Efficiency Improvement	1.88	-0.01	
Clinton WWTP Influent Gates			
Clinton WWTP Auzillary Pumps			
Phosphorus Removal - Design		0.93	0.47
Phosphorus Removal - Construction		7.48	
Clinton Roof Rehab		0.83	0.38
Clinton Facilities Rehab			4.48
Valves and Screw Pumps Replacement		0.40	1.1
NGRID Gas Line		0.49	
TOTAL	**$2.18**	**$13.47**	**$6.43**

Clinton Wastewater Treatment Plant ($ millions)		
FY17-18		
Suphase	*$*	
Phosphorus Removal - Construction	$ 6.59	78.8% of total spending
All (5) other contracts	$ 1.77	
TOTAL	**$ 8.37**	
FY14-18		
Suphase	*$*	
Phosphorus Removal - Construction	$ 7.48	80.4% of total spending
Clinton Digester Cleaning & Rehab	$ 3.35	
All (5) other contracts	$ 2.64	
TOTAL	**$ 13.47**	

Table 19

Residuals

Residuals Asset Protection

- Total future spending is proposed at $103.0 million[4]
- Design costs for $2.0 million are scheduled to begin in FY18 for any projects requiring design by MWRA
- $2.7 million is included through FY21 to begin first projects needed in the five-year extension period
- Condition assessment/technology and regulatory review have been conducted
    - Total budget was $0.83 million
    - Results may point to need for additional feasibility studies on possible process change
- Spending during FY17-18 is budgeted at $2.8 million
- Total budgeted costs are unchanged from the final FY17 CIP, at $103.8 million

Combined Sewer Overflow Control Program

- Substantial completion on the multi-year CSO Control Program was reached by the court-ordered date of December 2015. All of the 35 projects are complete
- The Authority has been constructing the projects in the Long-Term Control Plan for over 20 years, since 1996, according to the December Court Report
- The CSO Control Program has included the management of 125 contracts, including 82 construction contracts, 33 engineering contracts and 10 planning and technical support contracts, as well as 6 community financial assistance agreements. To date, MWRA has spent $893.5 million on the CSO control efforts, or 98% of the $909.5 million budget, on the 35 CSO projects
- Region-wide CSO discharge volume in a typical rainfall year has been reduced from 3.3 billion gallons to 0.4 billion gallons, an 88% reduction, with at least 93% of the remaining CSO volume treated at MWRA's four remaining CSO facilities
- Total project costs: $909.5 million
- Change from FY17 CIP: +$2.88 million
    - Cambridge Sewer Separation increase: +$1.7 million
    - CSO Support increase: +$1.4 million
    - Reserved Channel Sewer Separation decrease: -$0.1 million
- Much lower levels of spending will continue through FY 2021, when MWRA is to complete a sewer system performance assessment verifying attainment of the goals for long-term CSO control levels
- Cash flows and spending schedules are tied to dates established in the Court Order
- MWRA has five years following construction of the last CSO project in 2015 to complete, by December 2020, post-construction monitoring and a performance assessment to verify the approved long-term levels of CSO are achieved
- As part of the agreement, DEP agreed to continue to reissue, and EPA agreed to approve, the Charles River and Alewife Brook/Upper Mystic River CSO variances through 2020 without additional CSO controls beyond the approved plan

[4] FY18 and beyond

Table 20

Remaining CSO Spending ($ millions)				
	Proposed FY18 CIP	Spent/Transferred thru Dec 2016	Remaining Spending	Remaining Spending Activity
MWRA	$486.3	$483.0	$3.3	3-year CSO performance assessment thru December 2020; Somerville Agreement
City of Cambridge	105.6	102.9	2.7	CAM004 surface restorations thru Dec 2017
BWSC	294	290.2	3.8	Dorchester inflow removal
Town of Brookline	23.6	23.6	0	
TOTAL	**$909.5**	**$896.8**	**$9.8**	

Table 21

CSO Spending ($ millions)			
Project	**FY09-13**	**FY14-18**	**Beyond FY18**
North Dorchester Bay	$82.58	-$0.11	
East Boston Branch Sewer Relief	74.94	-0.01	
MWR003 Gate & Siphon	0.65	3.80	
Dorchester Bay Sewer Separation (Fox Point)	0.39	0.47	
Dorchester Bay Sewer Separation (Commercial Point)	6.26	-0.73	3.76
Stony Brook Sewer Separation	-0.86	0.05	
Union Park Detention Treatment	-0.27	0.00	
Cambridge Sewer Separation	32.03	53.96	
Cambridge Floatables	0.16	0.40	
Fort Point Channel Sewer Separation	3.72	-0.01	
Morrissey Boulevard Drain	17.67	-0.16	
Reserved Channel Sewer Separation	57.32	10.57	
Brookline Sewer Separation	24.73	-1.28	
Bulfinch Triangle Sewer Separation	9.36	-0.80	
Charles River CSO	2.53	0.00	
CSO Support	4.28	0.46	1.82
TOTAL	**$315.49**	**$66.23**	**$5.58**

Other Wastewater Projects

Infiltration/ Inflow Local Financial Assistance Program

- Includes one major project/program: the Infiltration/Inflow Local Financial Assistance Program
- Total budget: $242.6 million[5]
- Through FY16 grants/loans net of repayments: $163.4 million
- Net remaining balance: $79.2 million
- FY14-18 net budget: $73.1 million
- Net budget for FY17-18: $37.9 million
- Program inception: August 1992
  - Phase 1 and 2: 25% grants/75% loans
  - Phases 3 through Phase 8: 45% grants/55% loans
    - Total each phase: $40 million
    - Repayment period: five years
  - Phases 9 and 10: 75% grants/25% interest-free loans
    - Total each phase: $80 million
    - Repayment period: ten years
- Through February 2017:
  - Distributed: $322 million
  - All 43 wastewater communities have participated
  - Number of local sewer rehabilitation projects funded: 524
- Total funding for all ten phases: $460.75 million
  - Distributed: $322 million
  - Remaining: $139 million
- Loan Repayments to date: $154 million
- Remaining balance: $64 million

[5] Net of repayments

Waterworks Capital Spending

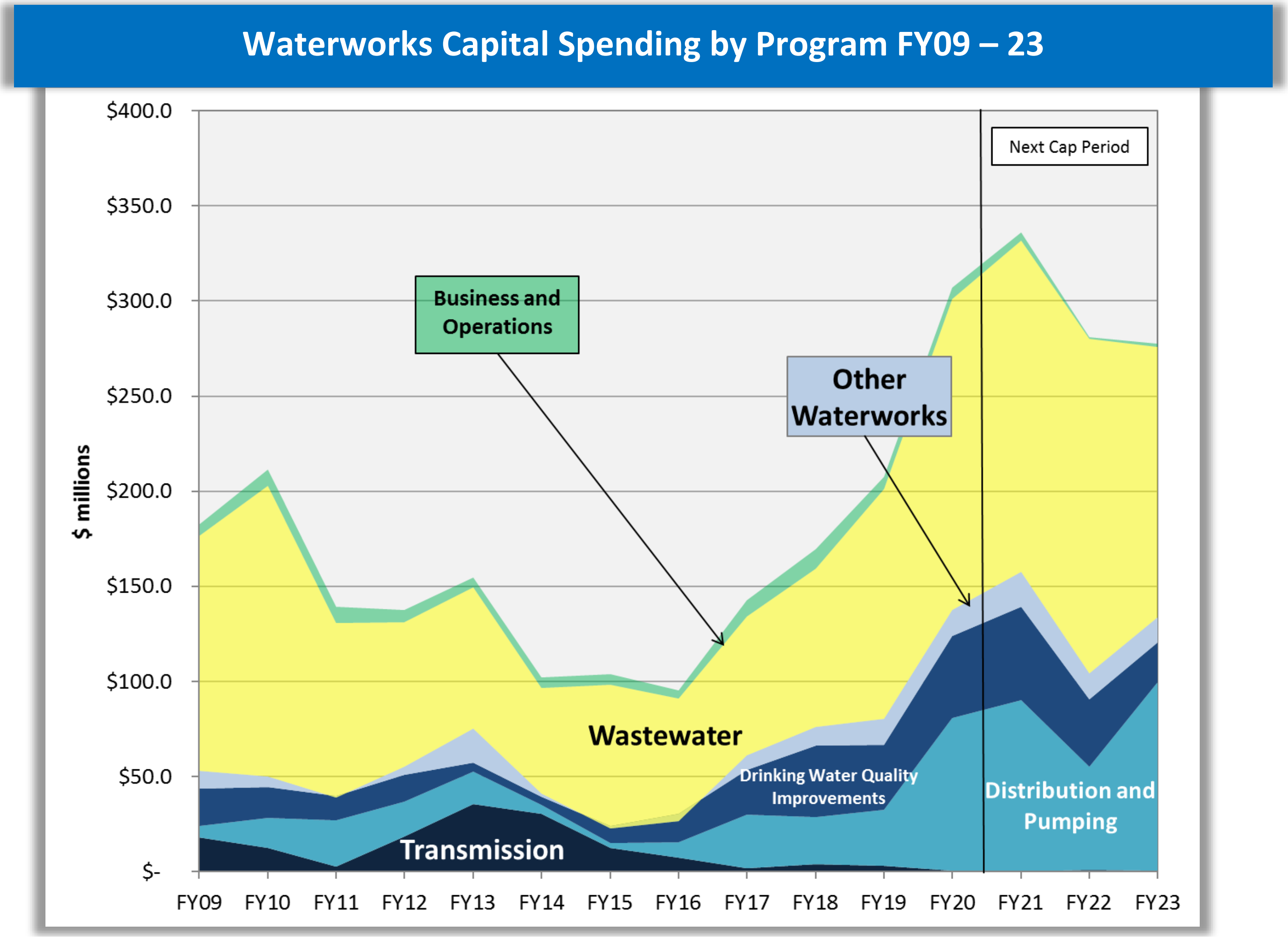

Figure 6

- There are four main categories of Waterworks spending
    1. Drinking Water Quality Improvements
    2. Transmission
    3. Distribution and Pumping
    4. Other projects
- Active waterworks projects in the proposed CIP: $4.0 billion
    - Increase from FY17 CIP: $0.19 billion
    - Spending through FY16 is $1.97 billion
    - Balance going forward is $2,027.5 million
- FY14-18 spending: $227.5 million
- FY17-18 spending: $137.1 million
- Ten projects make up nearly all Waterworks spending for FY17-18
- Five of these are in the Authority's ten largest projects for FY17-18:
    1. Long-Term Redundancy ($36.82 million)
    2. Northern Intermediate High Redundancy and Storage ($39.88 million)

3. Southern Extra High Redundancy and Storage ($19.83 million)
4. Local Water Assistance Program ($10.74 million)
5. Carroll Water Treatment Plant ($4.7 million)

Table 22

Largest 10 Waterworks Projects FY17-18 $ millions				
Utility	**Program**	**Project**	**FY17-18 Spending**	**% of Total Waterworks FY17-18 Spending**
Waterworks	Transmission	622 Cosgrove Tunnel Redundancy	$38.28	
Waterworks	Distribution and Pumping	722 NIH Redundancy & Storage	29.88	
Waterworks	Distribution and Pumping	727 SEH Redundancy & Storage	19.83	
Waterworks	Other	765 Local Water System Assistance Program	10.74	
Waterworks	Drinking Water Quality Improvements	542 Carroll Water Treatment Plant	4.66	
Waterworks	Other Waterworks	753 Central Monitoring System	4.19	
Waterworks	Transmission	597 Winsor Station Pipeline	3.40	
Waterworks	Transmission	621 Watershed Land	3.08	
Waterworks	Other	766 Waterworks Facility Asset Protection	2.84	
Waterworks	Transmission	625 Metropolitan Tunnel Redundancy	2.25	
Top 10 Waterworks Spending in FY17-18			**$119.15**	**86.9%**
FY17-18 Waterworks Spending			**$137.1**	**100.00%**

Drinking Water Quality Improvements

- Budgeted FY14-18 spending: $55.3 million
- Proposed FY17-18 spending: $5.5 million
- These projects focus on the treatment and storage of the MWRA’s water supplies including:
  - John J. Carroll Treatment Plant (CWTP) and related contracts
    - FY14-18 spending: $12.3 million
    - FY17-18 spending: $4.7 million

  - Spot Pond Storage Facility and Pump Station
    - FY14-18 spending: $35.7 million
    - FY17-18 spending: $884.9 thousand
    - All of funds expected to be spent by FY18 year-end
    - Spot Pond Storage Facility and Pump Station is nearing completion
  - Both Blue Hills Covered Storage Reservoir ($40.1 million) is complete
  - Norumbega Covered Storage ($106.7 million) is complete
  - Brutsch Water Treatment Facility ($20.0 million) is complete

Transmission

- The water transmission system consists of more than 100 miles of tunnels and aqueducts that transport water daily by gravity from the supply reservoirs to points of distribution within the service area.
- Budgeted FY14-18 spending: $68.3 million
- 77% of this cap period spending scheduled in FY17-18
- Proposed FY17-18 spending: $52.7 million
- Largest projects during FY17-18 include:
  - Cosgrove Tunnel Redundancy: $38.3 million
  - Winsor Station Pipeline: $3.4 million
  - Watershed Land: $3.1 million
  - Metropolitan Tunnel Redundancy: $2.2 million
  - Sudbury/Weston Aqueduct Repairs: $1.7 million

Policy Point — Metropolitan Tunnel Redundancy

"The Next Mega Project?"

Since its inception, the MWRA waterworks system has evolved into an intricate structure stretching across the state. A major piece of asset protection for this complex system is redundancy, providing backup channels for the water supply. Redundancy allows the Authority to provide proactive maintenance and rehabilitation to the water system with little interruption of service to the ratepayers. Redundancy also secures the water system, providing alternative pathways in the event of a break or leakage in the system.

Piece by piece, the Authority has increased redundancy in the water system through piping, storage, and tunneling. For years, the MWRA proposed projects in its capital program aiming toward providing redundancy specifically for the metropolitan region of the system. Among the various proposals included in the capital budget were a series of projects using surface piping. As plans for these surface piping projects were further evaluated, the Authority became concerned about the impacts upon the communities through which they would be built. Though costlier, the MWRA began to evaluate tunnel options with fewer impacts to communities.

In its proposed FY17 CIP the MWRA has included a $1.4 billion placeholder for the Metropolitan Redundancy Project. The original plan was to present and discuss these options to the MWRA Board of Directors during FY16, and selecting the final option to be included in the final FY17 CIP. It was the hope of the Authority that the Board would select a final project after reviewing options ranging from an $800 thousand surface piping project to a $1.4 billion deep rock tunneling project. With a selection entered into the FY17 CIP, the Authority would be able to start moving on the detailed planning needed before any construction would begin (in the 2020s). Some Board members raised concerns that the review schedule was too aggressive to make a final decision about project so complex, and the MWRA has decided to slow the process down.

In the FY17 Comments and Recommendations, the Advisory Board recommended that the Authority keep the $1.4 billion associated with metro-area redundancy in the CIP as a placeholder for the future redundancy project. The cost, scope, and makeup of any project(s) associated with the expense were to left be determined later on.

In October of 2016, the MWRA held an off-site Board of Directors meeting dedicated solely to discussing the redundancy project in depth. While the Authority was able to demonstrate the vital need for redundancy and massive scope of the project, some Board members were hesitant to give any final approvals without further input from the MWRA communities. The Advisory Board stepped in by hosting a MuniWorks conference on the redundancy project the following December. The conference was well attended by representatives from cities and towns, Massachusetts state government, and the labor industry. Advisory Board staff coordinated closely with Authority staff to enhance public awareness on the project. The conference included presentations from Secretary of Housing and Economic Development Jay Ash, Waltham Mayor Jeanette McCarthy, and MWRA staff. A consensus among the Advisory Board resulted in a recommendation being created for the project which included deep rock tunneling with no surface piping along with simultaneous construction for each tunnel in the project. This recommendation was unanimously approved at the following Advisory Board meeting in January 2017.

After the Advisory Board MuniWorks Conference and Advisory Board recommendation vote, the MWRA Board of Directors formally voted to approve the deep rock tunnel option for redundancy for the metropolitan area.

The timing of the Metropolitan Tunnel project comes amid talks of a possible federal infrastructure bill from Washington. The effects of funding towards the project would benefit ratepayers at multiple levels, especially when considering the report on the relationship and water/wastewater infrastructure and economic development that was commissioned by the Advisory Board from the Collins Center for Public Management. The report indicated that for every $1 invested in water and/or wastewater projects, $2 to $14 in new tax revenues are generated and an additional $2.62 to $6.77 in private investments are also spurred.

The Advisory Board reaffirms its recommendation that the Authority use the Program Management Division model, similar to the model used for the Boston Harbor Project, when implementing the Metropolitan Tunnel.

The Advisory Board recommends that the $4.8 million non-typical water revenue from FY 2017 be segregated and reserved to fund the Metropolitan Tunnel Redundancy project.

The Advisory Board expects that the Authority will be prepared to solicit any available new federal infrastructure funding for Metropolitan Tunnel Redundancy. The Advisory Board recommends that the Authority organize as many projects associated with Metropolitan Tunnel Redundancy into one large project, demonstrating the size and need of such asset protection.

Distribution and Pumping

- Includes projects that focus on the metropolitan system, which is divided into seven pressure zones and includes:
    - 284 miles of distribution pipeline east of Shaft 5
    - 11 storage tanks
    - 11 pump stations
    - 9 tunnel shafts

  - approximately 4,700 valves
- FY14-18 spending: $89.3 million
- FY17-18 spending: $61.1 million
- Largest projects in FY17-18:
  - Northern Intermediate High Redundancy and Storage: $28.88 million
  - Southern Extra High Redundancy and Storage: $19.83 million
  - Spot Pond Supply Mains Rehabilitation: $2.1 million
  - Shaft 7 to WASM Connecting Mains: $2.0 million

Other Waterworks Projects

- FY14-18 net spending: $14.7 million
- FY17-18 net spending: $17.78 million
- FY17-18 spending includes:
  - Central Monitoring System: $4.2 million
  - Local Water Pipeline Assistance Program +$10.8 million
    - Distributions: +$54.2 million
    - Loan repayments: -$43.5 million
  - Waterworks Facility Asset Protection: $2.8 million

Policy Point — Water Loan Program

"Next Phase, Next Steps"

Since 2001, over $300 million has been distributed in two phases to MWRA water communities in 0% interest loans to make improvements to their local systems. Rehabilitating local water distribution systems, along with aggressive watershed protection and upgraded treatment, constituted the "three-legged stool" to ensure the highest quality drinking water and the avoidance of a costly filtration plant.

The Operations Committee engaged MWRA staff in a discussion on the next stage of this program. The Committee unanimously voted to support a Phase III Local Water System Assistance Program (LWSAP). Their recommendations were then approved by the Advisory Board and the MWRA Board of Directors.

The recommendations included continuing the program using the same methodology for fund allocations as well as continuing to provide 10-year interest-free loans. Enhancements to the program in Phase III included providing funding for Phase III at an increased level of $292 million (taking into account current construction costs). Phase II distributions were also extended three additional years to FY23.

Business and Operations Spending

- FY18 Business and Operations spending: $10.2 million
  - One project in this category is among the top ten projects for the last two years of the FY14-18 spending cap:
    - Equipment Purchase: $4.9 million

Table 23

Largest Business & Ops Projects FY17-18 ($ millions)	
Project	**FY17-18 Spending**
Equipment Purchase	$4.9
Application Improvement Program	4.2
IT Infrastructure Program	3.7
Capital Maintenance Planning & Development	3.1
TOTAL	**$15.8**

- FY14-18 Business and Operations spending: $34.2 million
  - Decrease from final FY17 CIP: -$4.8 million
- MIS-related FY18 spending: $6.1 million
  - Application Improvement Program: $3.0 million
    - To improve efficiencies of business processes associated with managing operations and support divisions
  - Information Security Program: $665 thousand
    - To increase resiliency and sustainability of data security practices
  - Information Technology Management: $165 thousand
    - To improve oversight process for procurement of IT solutions throughout the Authority
  - IT Infrastructure Program: $2.3 million
    - To implement consolidated and optimized versions of equipment and databases
- Alternative Energy Initiatives FY14-18 spending: $1.2 million including
  - Fish Hatchery Pipeline Hydro: $1.0 million
  - Technical Assistance for Energy Efficiency: $169 thousand
- Capital Maintenance Planning and Development FY14-18 spending: $5.5 million
  - Includes spending on six contracts for as-needed design services
- Capital Equipment purchases in FY14-18: $11.3 million
  - Vehicle Purchases (FY14-18 specific): $6.5 million
  - Security Equipment & Installation: $4.2 million

  - Major Lab Instrumentation (FY14-18 specific): $629 thousand
- Technical Assistance Contract FY14-18 spending: $383 thousand
  - Supports such services as land appraisal, surveying, and hazardous materials assessment

Capital Spending Cap

Background for Setting a Five-Year Cap on Capital Spending, a Recap of the Cap

- The Authority first adopted a capital spending cap in 2001, setting a ten-year cap each year as part of the approval of the final CIP and annual caps for the first three years of the budget period. In each succeeding year, a new ten-year cap was calculated by removing the completed year, adding any unspent funds from the just completed year and adding a new tenth year in the amount of $100 million[6].
- In June 2003, the Board of Directors adopted a revised capital spending cap policy with a calculation that reflected projected expenditures for a five-year period, plus contingency allowances and inflation adjustments[7], less Chicopee Valley Aqueduct projects.
- A second provision of the cap allows annual spending within the five-year period to vary within plus or minus 20% of the initial amounts calculated for each of the five years, as long as the five-year total is not exceeded. In the event that an annual cap limit is exceeded, the Authority may request approval by the Board of Directors to exceed the limit for an individual fiscal year.

The First Five-Year Cap: FY04-08

- Approved in June 2003 as part of the approval of the final FY04 CIP
- Baseline FY04-08 capital spending cap: $1.13 billion. (See Appendix E)
  - Based on projected capital spending of $1.0233 billion
- Actual spending: $888.5 million
- Spending according to the cap equation: $880.1 million
  - Underspending from the "baseline" cap: $254.4 million (22.4%)
- The Authority did not exceed the overall five-year cap or the allowance of 20% over the individual base year caps.

The Second Five-Year Cap: FY09-13

- Approved in June 2008 as part of the approval process for the final FY09 CIP (See Appendix E)
- Baseline FY09-13 capital spending cap: $1.14 billion
  - Based on projected capital spending of: $1.08 billion
- Actual spending: $825.1 million
  - Lower than the first cap period
- Spending according to the cap equation: $821.0 million
  - Underspending from the "baseline" cap: $322.8 million (28.2%)

The Third Five-Year Cap: FY14-18

- During the review of the proposed FY13 CIP, the Advisory Board, noting the lower than budgeted spending of the first two periods and observing the progress toward completing the court-ordered CSO Control Program, challenged the Authority to limit the FY14-18 cap to no more than $800 million

[6] Adjusted for inflation.
[7] On unawarded construction contracts.

- The Authority reshaped its proposed capital program and reconsidered the scheduling for a number of projects, and recommended a new five-year cap below the $800 million challenge

Table 24

FY14-18 Baseline Cap Calculation Versus Updated Spending Projections ($ millions)						
	FY14	**FY15**	**FY16**	**FY17**	**FY18**	**Total FY14-18**
Projected Expenditures	$142.5	$147.6	$149.3	$141.8	$136.8	$718.0
Contingency	7.6	9.5	10.1	9.8	9.3	46.1
Inflation on Unawarded Construction	0.8	4.2	8.4	11.1	13.5	37.9
Less: Chicopee Valley Aqueduct Projects	-5.0	-2.2	-1.4	-1.3	0.4	-10.3
FY14-18 Baseline Cap	**$145.8**	**$159.1**	**$166.4**	**$161.3**	**$159.1**	**$791.7**
Projected Expenditures	$102.2	$103.6	$95.1	$142.9	$169.5	$613.3
Contingency	0.0	0.0	0.0	7.6	9.8	17.4
Inflation on Unawarded Construction	0.0	0.0	0.0	0.0	1.1	1.1
Less: I/I Program	0.0	-17.5	-13.6	-18.8	-19.0	-69.0
Less: Water Loan Program	0.0	1.4	5.3	-3.3	-7.5	-4.0
Less: Chicopee Valley Aqueduct Projects	-5.6	-1.2	-0.4	-0.1	-0.7	-8.0
FY18 Proposed Subtotal	**$96.6**	**$86.3**	**$86.4**	**$128.2**	**$153.3**	**$550.8**
Change ($)	-49.2	-72.7	-80.0	-33.1	-5.9	-240.9
Change (%)	-33.7%	-45.7%	-48.1	-20.5%	-3.6%	-30.4%

- The FY14-18 baseline cap was approved in June 2013 as part of the approval process for the final FY14 CIP
- Baseline FY14-18 capital spending cap: $791.7 million
  - Based on projected capital spending of: $718.0 million
- Updated FY14-18 spending: $613.3 million[8]
  - This is $211.8 million less than the $825.1 million in actual spending for the previous cap period.
- As compared to the baseline cap spending used in establishing the original FY14-18 cap, spending for the 5-year period is nearly $105 million lower than the $718.0 million set in June 2013. (See Figure 7 and Table 24)

[8] Projected for FY14, proposed for FY15-18.

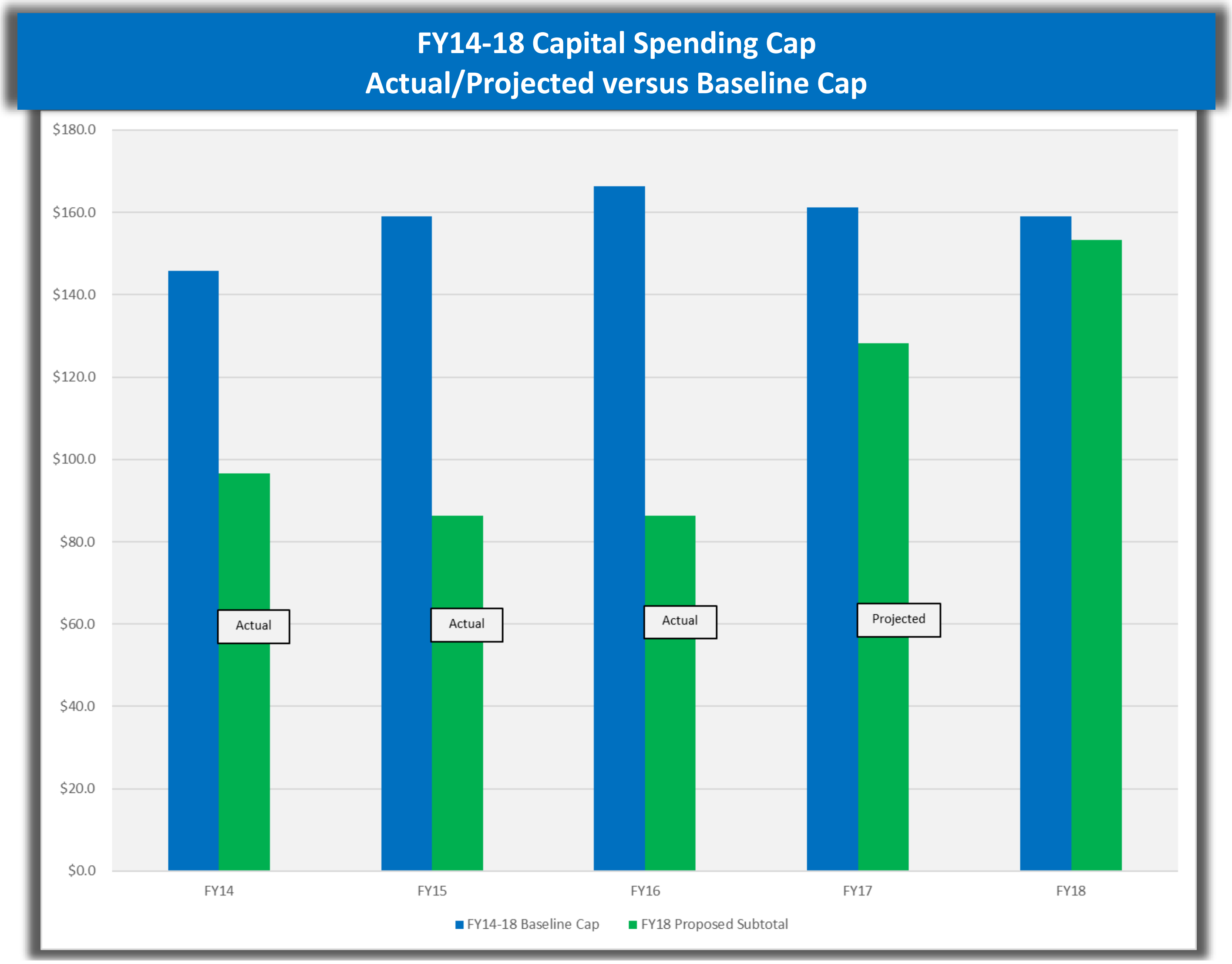
FY14-18 Capital Spending Cap
Actual/Projected versus Baseline Cap
$180.0
$160.0
$140.0
$120.0
$100.0
$80.0
$60.0
$40.0
$20.0
$0.0
Actual
Actual
Actual
Projected
FY14
FY15
FY16
FY17
FY18
FY14-18 Baseline Cap
FY18 Proposed Subtotal

Figure 7

Proposed FY18 Current Expense Budget

Proposed FY18 CEB Highlights

Table 25

MWRA Current Expense Budget
($ millions)

	FY17 Budget	FY18 Proposed	$ Change	% Change
Expenses				
Direct Expenses	226.5	238.4	11.9	5.2%
Indirect Expenses	38.0	41.58	3.6	9.5%
Capital Financing	455.1	469.1	14.0	3.1%
Subtotal Expenses	***$719.6***	***$749.1***	***$29.5***	***4.1%***
Offsets				
Bond Redemption	0.0	0.0	0.0	-
Debt Service Assistance	0.0	0.0	0.0	-
Subtotal Offsets	***$0.0***	***$0.0***	***$0.0***	-
Net Expenses	**$719.6**	**$749.1**	**$29.5**	**4.1%**
Revenues				
Other User Charges	8.8	9.0	0.2	2.4%
Other Revenue	6.3	7.7	1.3	21.2%
Rate Stabilization	0.0	0.0	0.0	-
Investment Income	9.5	11.3	1.8	18.8%
Subtotal Non-Rate Revenue	***$24.5***	***$27.9***	***$3.3***	***13.6%***
Rate Revenue	***$694.9***	***$721.2***	***$26.4***	***3.79%***
Total Revenue and Income	**$719.4**	**$749.1**	**$29.7**	**4.1%**

$6.95 million ≈ 1% of FY17 rate revenue

- MWRA's total budget increases 4.1%, but wholesale rate revenue increases 3.79%

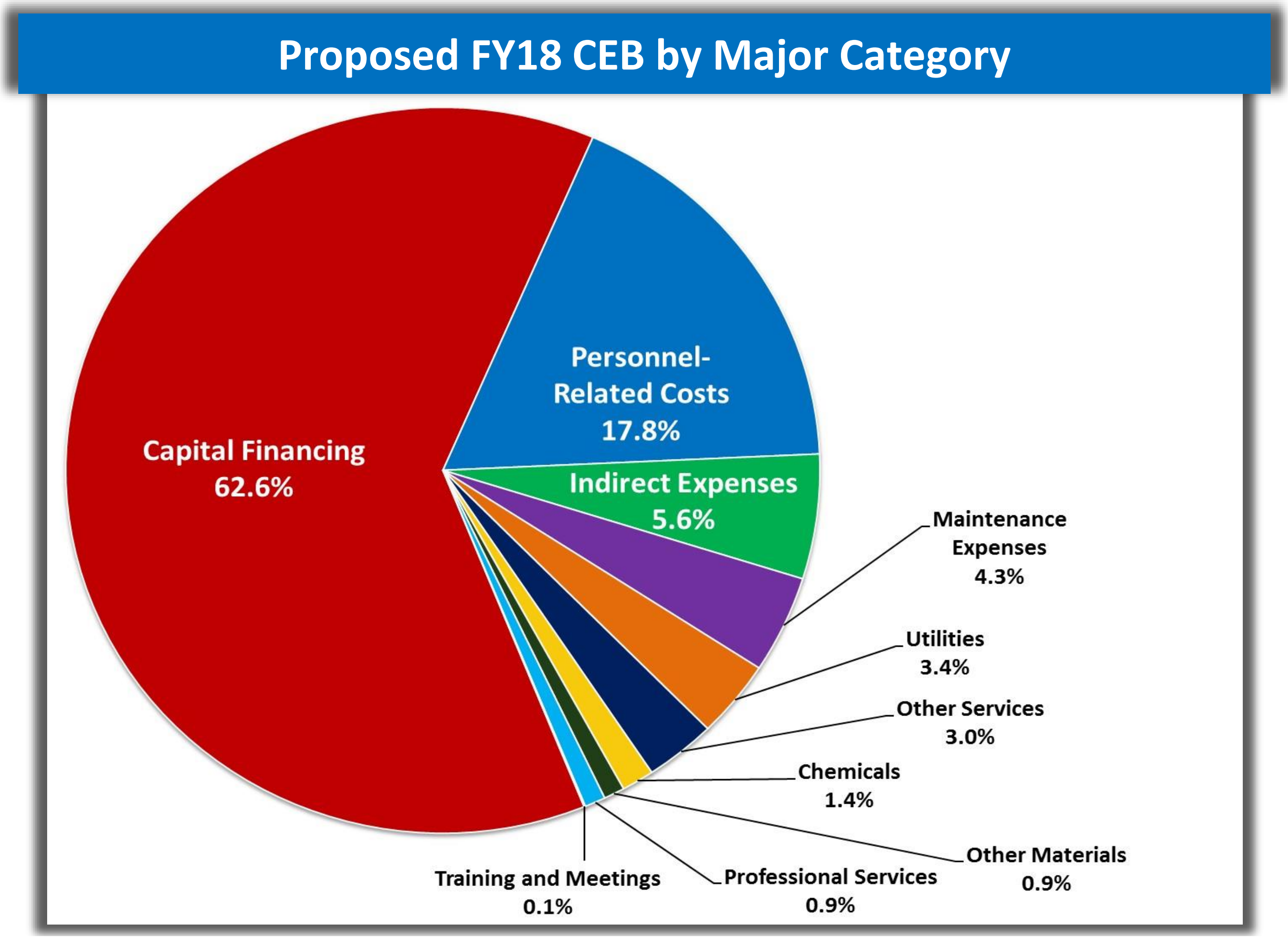

Figure 8

Direct Expenses

- Direct expenses: $238.4 million
    - 32% of proposed CEB
- Personnel-related costs: $133.1 million
    - Nearly 56% of all direct expenses and include:
        - Wages and salaries
        - Overtime
        - Fringe benefits
        - Workers' compensation
- Maintenance: $32.5 million
    - Nearly 14% of direct expenses
    - Second largest category
    - Larger maintenance projects are part of the capital budget.
- Utilities: $25.7 million
    - Nearly 11% of all direct expenses
    - Electricity: $14.2 million (almost 55% of utilities)
        - Decreases 12.4% from FY17
- Other services: $22.8 million
    - 9.6% of direct expenses
    - Sludge pelletization decrease from FY17: -2.3%

- Chemicals expense: Just over $10.4 million
    - 4.4% of direct expenses
- Remaining direct expenses: $13.7 million
    - 5.8% of direct expenses and includes:
        - Professional services
        - Other materials
        - Training and meetings

Indirect Expenses

- Total: $41.6 million
    - Makes up 5.6% of total expenses
- Largest components are:
    - Watershed-related expenses (just over $25 million)
    - Pension fund deposit ($5.1 million)
        - This line has increased by 9.6% from FY17 due to an optional payment of $1.8 million
    - Optional pension fund deposit/Other Post-Employment Benefits ($5.0 million)
        - Having fully funded the pension, the current approach is to make an OPEB deposit equal to 50% of the Actuarial Calculated Contribution (ACC).[9]

Capital Financing Expense

- Total: $469.12 million
    - Makes up 62.6% of all expenses
- Debt service: $448.6 million
    - Makes up 95.6% of capital financing
    - Includes principal and interest payments on:
        - State Revolving Fund (SRF) borrowings
        - Senior debt
        - Subordinate debt
    - Includes $10.9 million in debt prepayment

Remaining capital financing expenses: $20.5 million

- Supports:
    - Water pipeline commercial paper program ($4.09 million)
    - Current revenue for the capital program ($13.2 million)
    - Capital lease payments for the debt portion of the Chelsea facility ($3.2 million)

[9] Although the Authority refers to the OPEB contribution recommended in the actuarial study as an ARC, similar to the pension, the Advisory Board has adopted the ACC nomenclature to emphasize the fact that OPEB contributions are not, at this time, required by law.

"Delta Report" Total MWRA Spending Increases $29.5 Million

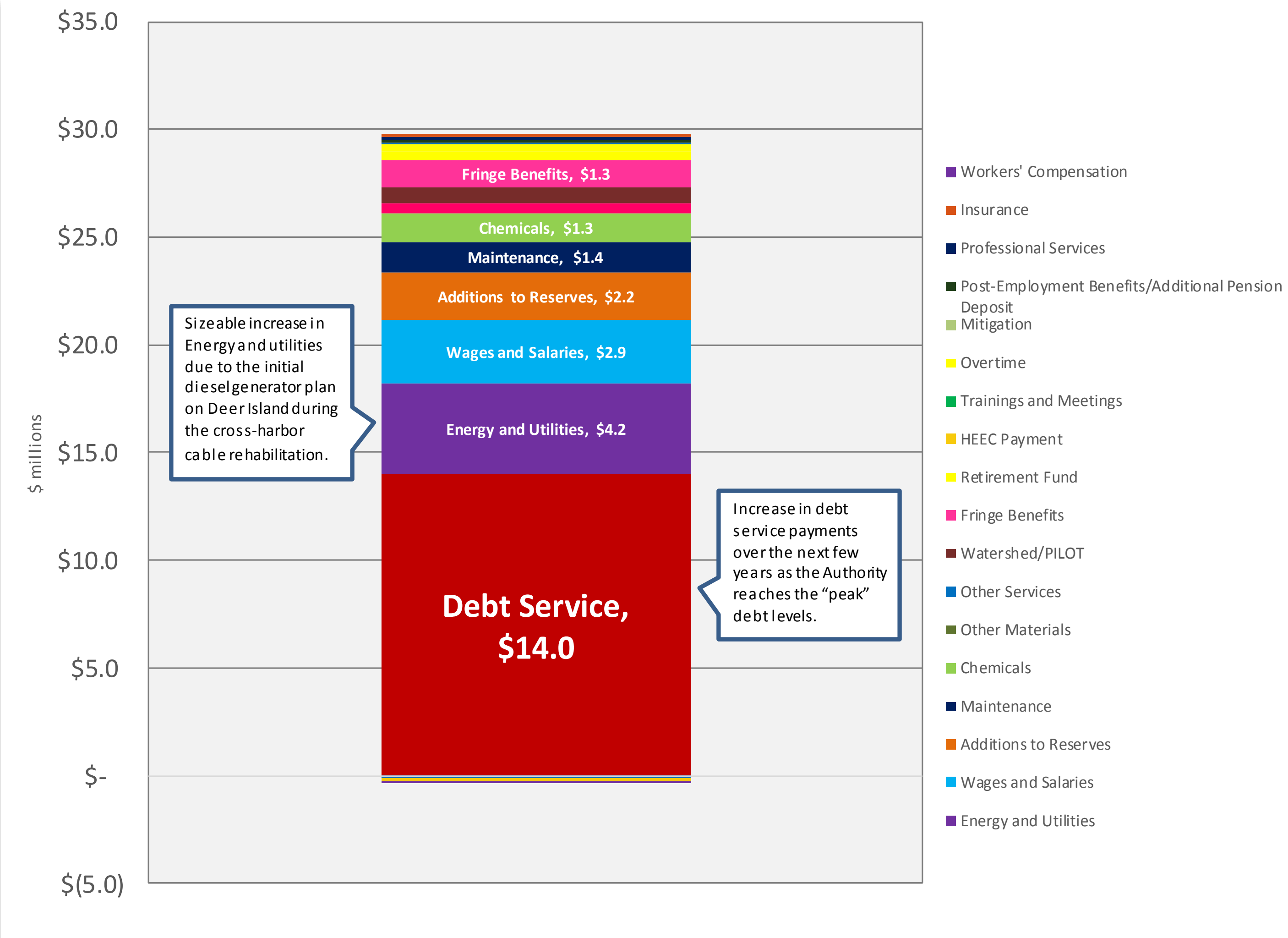

Figure 9

- Debt Service: +$14.0 million
  - Largest increase
- Energy and Utilities: +$4.2 million
  - Second largest increase
- Wages and Salaries increase: +$2.9 million
  - Third largest increase
- Decreases partially offsetting total "delta" include:
  - Other Services (-$142 thousand)
  - HEEC Payment (-$103 thousand)
  - Training and Meetings (-$29 thousand)

Revenues

- Rate revenue requirement: $721.2 million
  - Increase from FY17: $26.4 million (3.8%)
  - Makes up over 96% of total revenue
  - Raised through wholesale water and sewer rates

- Non-rate revenue: $27.9 million
    - Increase from FY17: $3.3 million
    - Makes up 3.7% of total revenue
    - Sources include:
        - Investment income
        - Other revenue
        - Other user charges
- FY11 rate revenue increase of 1.49% ($8.4 million) was the lowest in the previous 15 years, since 1996 when the Authority received $31.5 million in state debt service assistance.
- Rates are currently projected to increase by nearly $143 million for the next five years. (See Figure 10)

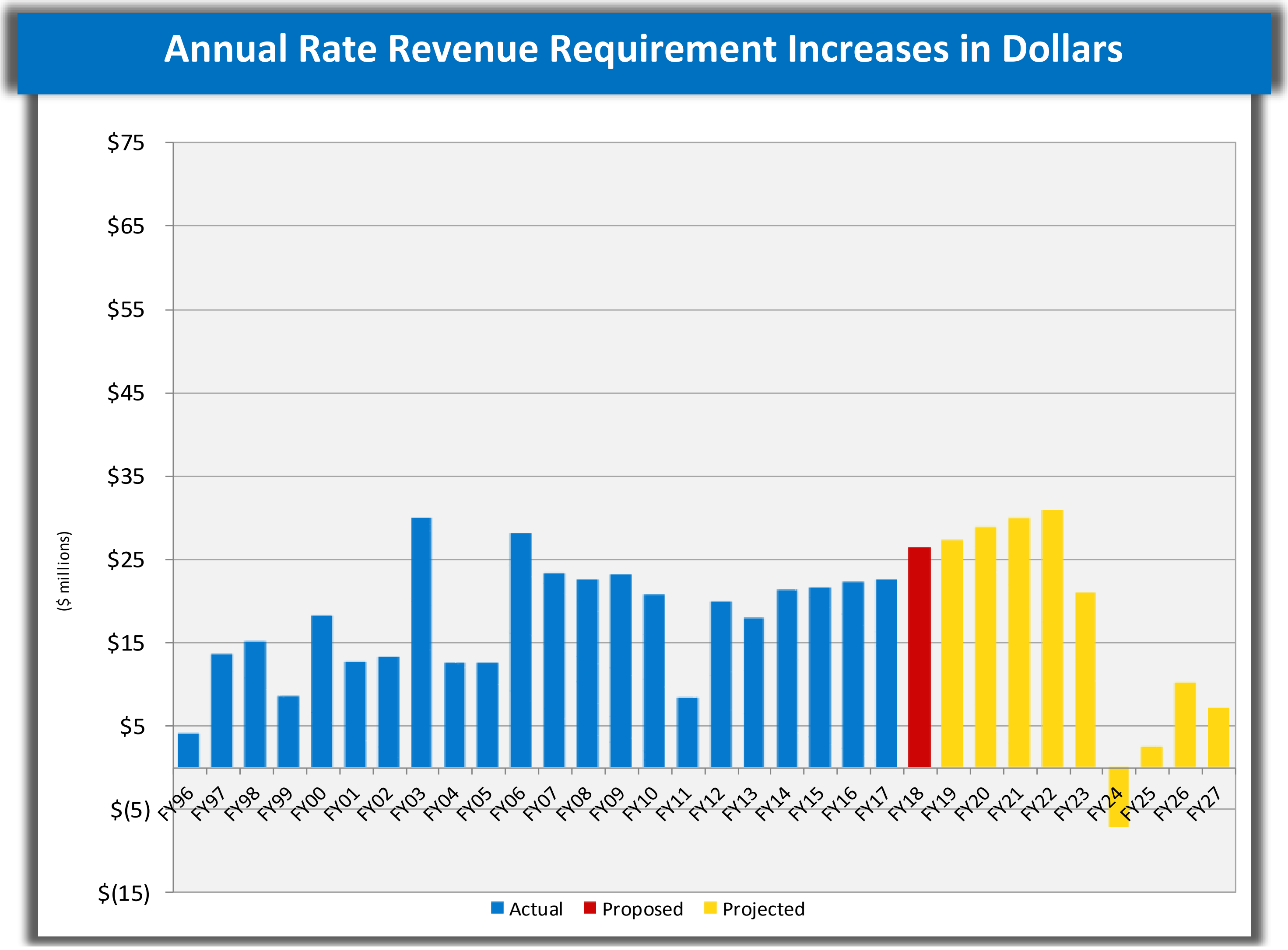

Figure 10

- The rate increases, lower than previous projections, reflect a multi-year rates management strategy to keep rates at sustainable levels during these continued challenging times
- Defeasance: the prepayment of a portion of a future year's debt service using current-year surplus funds.
    - This tool has been used consistently and strategically
- Proposed FY10 CEB was the first proposed budget to assume benefits of a planned defeasance transaction
- This assumption allows proposal of lower rate revenue increases than earlier projected
- Total defeased debt between 2006 and projected FY17 defeasance: $521.2 million (See Figure 17)

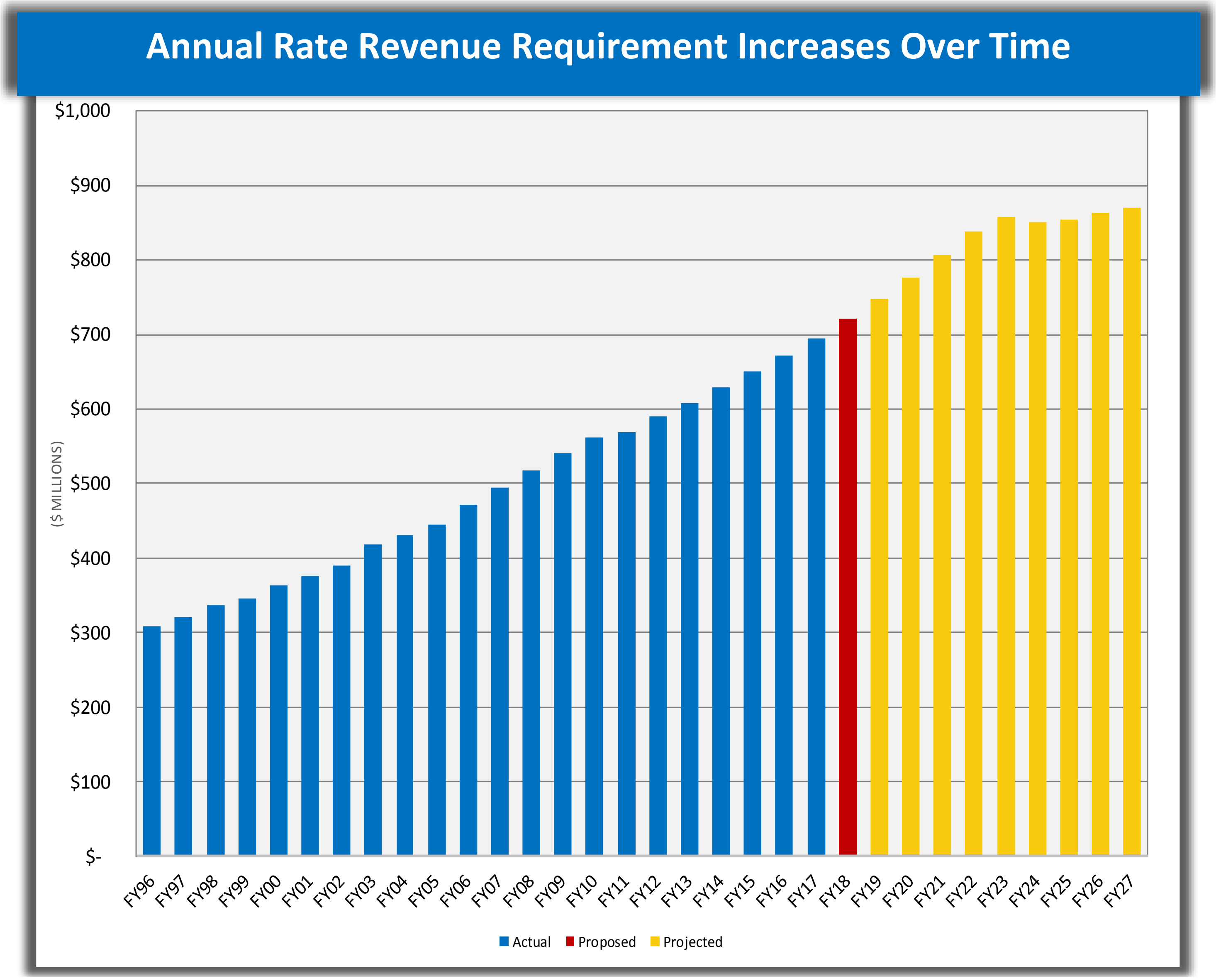
Annual Rate Revenue Requirement Increases Over Time
$1,000
$900
$800
$700
$600
$500
$400
$300
$200
$100
$-
($ MILLIONS)
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
FY04
FY05
FY06
FY07
FY08
FY09
FY10
FY11
FY12
FY13
FY14
FY15
FY16
FY17
FY18
FY19
FY20
FY21
FY22
FY23
FY24
FY25
FY26
FY27
Actual
Proposed
Projected

Figure 11

Proposed FY18 Current Expense Recommendation

The Advisory Board has recommended or identified about $4.9 million in line item reductions, some increases, as well as some transfers between line items. Consistent with its practice in recent years, Advisory Board staff worked with Authority staff to incorporate updated assumptions into the budget review. Authority staff also identified some line item and revenue reductions and increases as part of this process, which we'll detail in our review (See Appendix C).

Therefore, the Advisory Board recommends reducing the FY18 Rate Revenue Requirement by $4,163,934 resulting in a combined wholesale assessment increase of 3.19%

Major Categories of Spending

Detailed discussion of the major categories of spending follows in order of highest to lowest level of spending:

Table 26

Proposed FY18 CEB Major Categories of Spending	
$ millions	
Capital Financing	$469.1
Personnel-Related Costs	133.1
Indirect Expenses	41.6
Maintenance Expenses	32.5
Utilities	25.8
Other Services	22.8
Chemicals	10.4
Other Materials	6.7
Professional Services	6.7
Training and Meetings	0.4
TOTAL EXPENSES	**$749.1**
REVENUE	**$749.1**

Capital Financing

Table 27

$ millions

Line Item/Description	Final FY17	Proposed FY18	Δ ($s)	Δ (%)
Total Senior Debt Service	**$268.47**	**$263.12**	**-$5.35**	**-2.0%**
Outstanding	263.09	255.46	-7.64	-2.9%
New FY17/FY18	5.62	9.24	3.62	64.3%
Potential Defeasance/Restructuring	-0.25	-1.58	-1.33	-538.2%
Fixed rate debt service, existing and new borrowings				
Total Subordinate Debt Service	**70.00**	**87.55**	**17.56**	**25.1%**
Outstanding	70.00	87.55	17.56	25.1%
New FY17/FY18	0.00	0.00	0.00	-
Potential Defeasance/Restructuring	0.00	0.00	0.00	-
Variable rate debt service: 3.50% interest rate assumption				
Total SRF Debt Service	**86.97**	**87.04**	**0.07**	**0.1%**
Outstanding	85.39	82.75	-2.64	-3.1%
New FY17/FY18	1.58	4.29	2.71	170.9%
Low-interest loans from the Commonwealth. 2.0% interest rate (Water); 2.5% (Sewer)				
TOTAL DEBT SERVICE	**425.44**	**437.72**	**12.28**	**2.9%**
Water Pipeline Commercial Paper	**4.15**	**4.09**	**-0.06**	**-1.5%**
Debt service supporting $25 million/year for the Local Water Pipeline Improvement and Local Water System Assistance Loan Programs				
Current Revenue/Capital	**12.20**	**13.20**	**1.00**	**8.2%**
Amount of current revenue used to fund ongoing capital projects and to meet coverage requirements				
CORE Fund Deposit	**-**	**-**	**-**	**-**
The CORE Fund is no longer required, per revisions to the bond resolution				
Capital Lease	**3.22**	**3.22**	**0.00**	**0.0%**
Chelsea facility lease payment				
Debt Prepayment	**10.99**	**10.90**	**10.90**	**0.0%**
Advance payment of future principal				
TOTAL OTHER CAPITAL EXPENSES	**30.56**	**31.40**	**0.84**	**2.8%**
Bond Redemption	**0.00**	**0.00**	**0.00**	**-**
Bond Redemption funds used to reduce capital financing expense				
Debt Service Assistance (offset)	**-0.87**	**0.00**	**0.87**	**-100.0%**
The state-wide program providing assistance with wastewater debt service is not assumed in the Commonwealth's FY17 budget.				
TOTAL CAPITAL FINANCING EXPENSES	**$455.13**	**$469.12**	**$13.99**	**3.1%**

Other Highlights

- Planned FY18 borrowings:
  - MWRA: $100 million
  - SRF: $26.0 million sewer and $16.0 million water, total of $42 million
  - The projected capital spending scheduled for fiscal year 2018 is less than scheduled principal payments which will contribute to decrease MWRA's outstanding indebtedness
- Proposed FY18 CEB also includes full year debt service for new borrowings during FY17

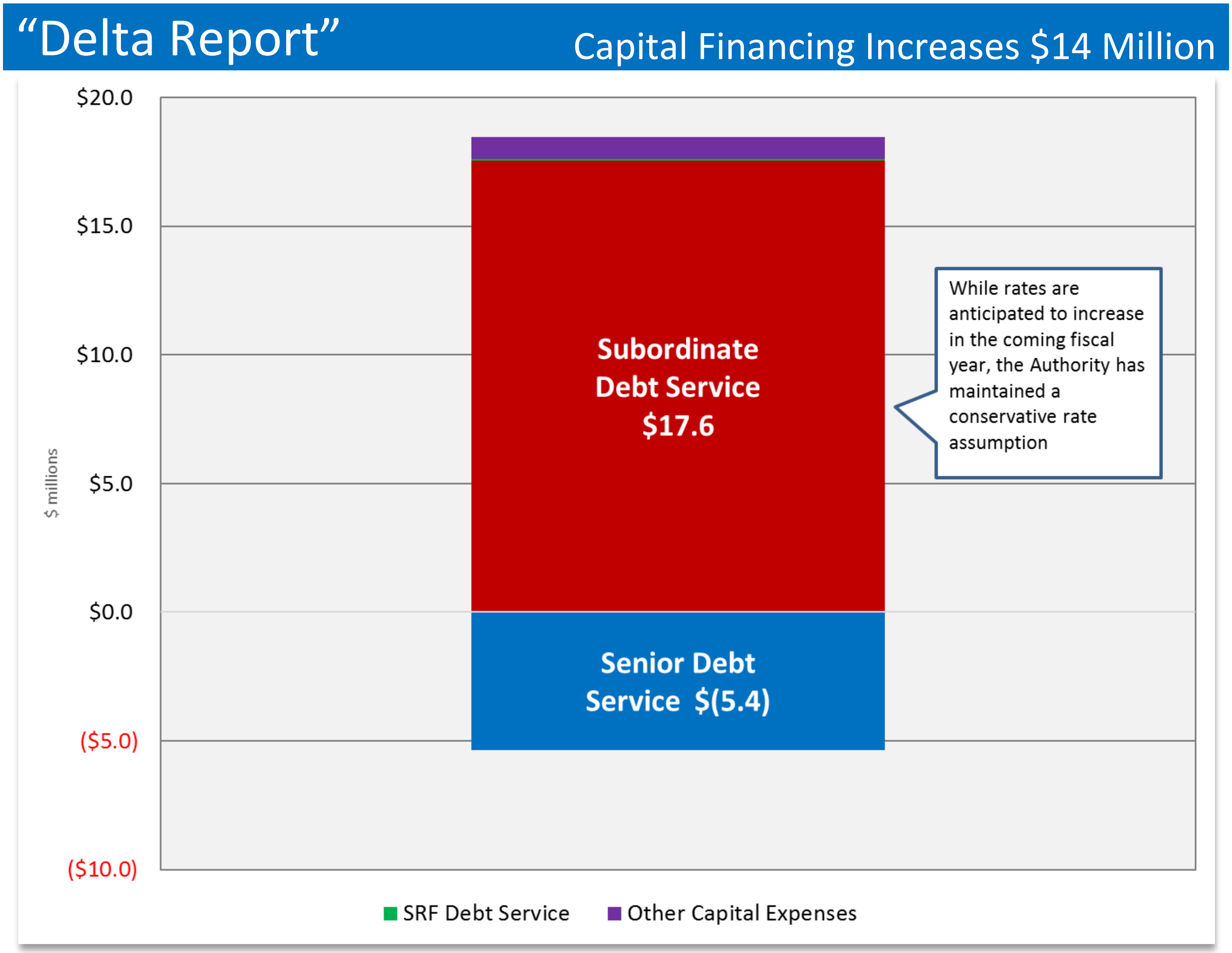

Figure 12

- The Authority relies heavily on debt financing to fund its capital program
- The Authority has spent over $8.0 billion on its capital improvement program[10]
- For FY18, capital financing expense as a percent of all expenses is 62.6% (See Figure 13)

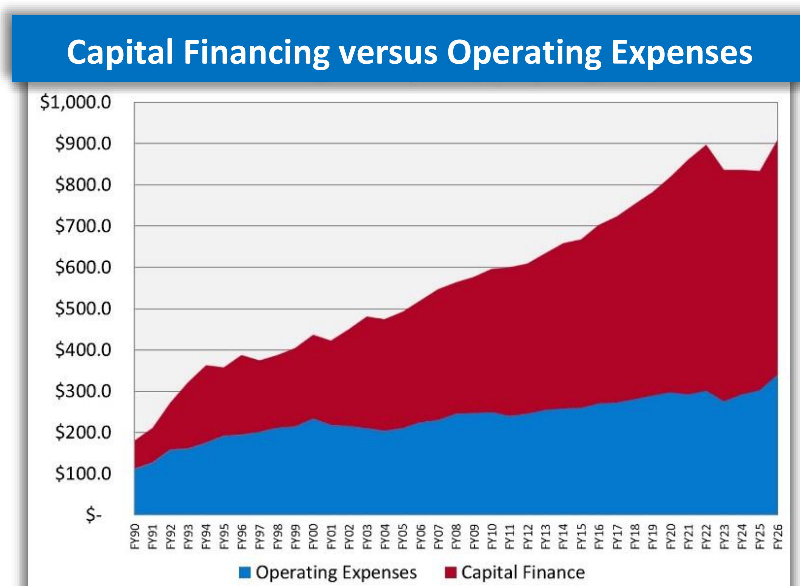

Figure 13

[10] Through FY16

- Outstanding principal borrowed totals $5.057 billion[11] and includes four categories:
    - State Revolving Fund (SRF)
    - Pure Variable (subordinate debt)
    - Swap Notional (subordinate debt)
    - Senior Debt
- Commercial paper (CP) outstanding: $149 million
    - Including CP, total outstanding principal = $5.206 billion
- Outstanding principal is declining and is $181 million less than the prior year

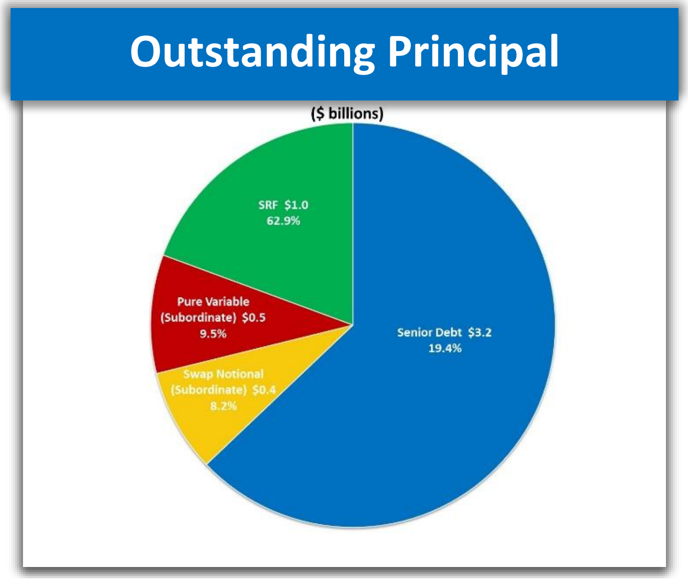

Figure 14

Debt Service on Senior Debt

- FY18 debt service on senior debt is $263.1 million
- Includes $1.6 million reduction in debt service due to $20 million defeasance in proposed FY18 CEB

Debt Service on Subordinate MWRA Debt

- FY18 debt service on subordinate debt: $87.6 million
- Variable rate debt interest rate assumption: 3.5%
    - 0.25% higher than the rate in FY17
    - Based on the interest rate for the daily and weekly series; liquidity fees for the Standby Bond Purchase Agreement, Letter of Credit, and Direct Purchase providers; and remarketing fees
    - Federal Reserve Board has indicated that rates may increase in the coming fiscal year
- One factor rating agencies consider when updating the Authority's bond rating is how much variable rate debt exposure the Authority has
- Outstanding variable rate debt: $895.5 million
    - Makes up 17.2% of all outstanding debt
    - Percentage has been declining over the last several years: just five years earlier it was 21% of all outstanding debt

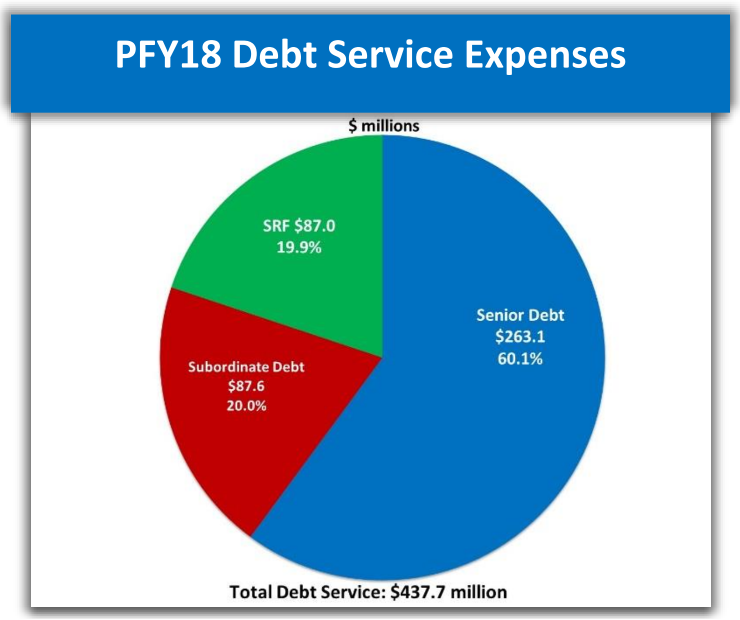

Figure 15

[11] As of December 31, 2016

Policy Point

Interest Rate Assumptions

"Don't Budget for Defeasance"

For years, the MWRA has used variable rate debt (VRD) as a portion of its overall debt portfolio and has saved significant amounts by so doing. The challenge, of course, is budgeting for the uncertainty of variable rate debt's interest rates. Beginning in FY11, the MWRA lowered its VRD interest rate assumptions to 3.25% to reflect the historically low interest rates. In fact, the low interest rates greatly benefited the MWRA, which has experienced interest rates far lower than this budgeted amount (See Figure 16). This difference between the budgeted interest rate and the actual interest rate generated significant surpluses in the variable rate debt line item, which became a core component of the defeasance account strategy (see page 56).

This defeasance account strategy was a landmark agreement to utilize surplus dollars from capital financing items to defease or prepay debt. For the Advisory Board, it was a victory for ratepayers that funds raised from them for capital financing expenses would ultimately be spent for this purpose rather than potentially redirected toward something else. While it approved dedicating these surplus funds, the Advisory Board viewed the high levels of underspending as an unexpected bonus caused by the historically low interest rates. The Advisory Board expected the unusually high levels of surplus funds would eventually decrease once interest rates came up, as they are today.

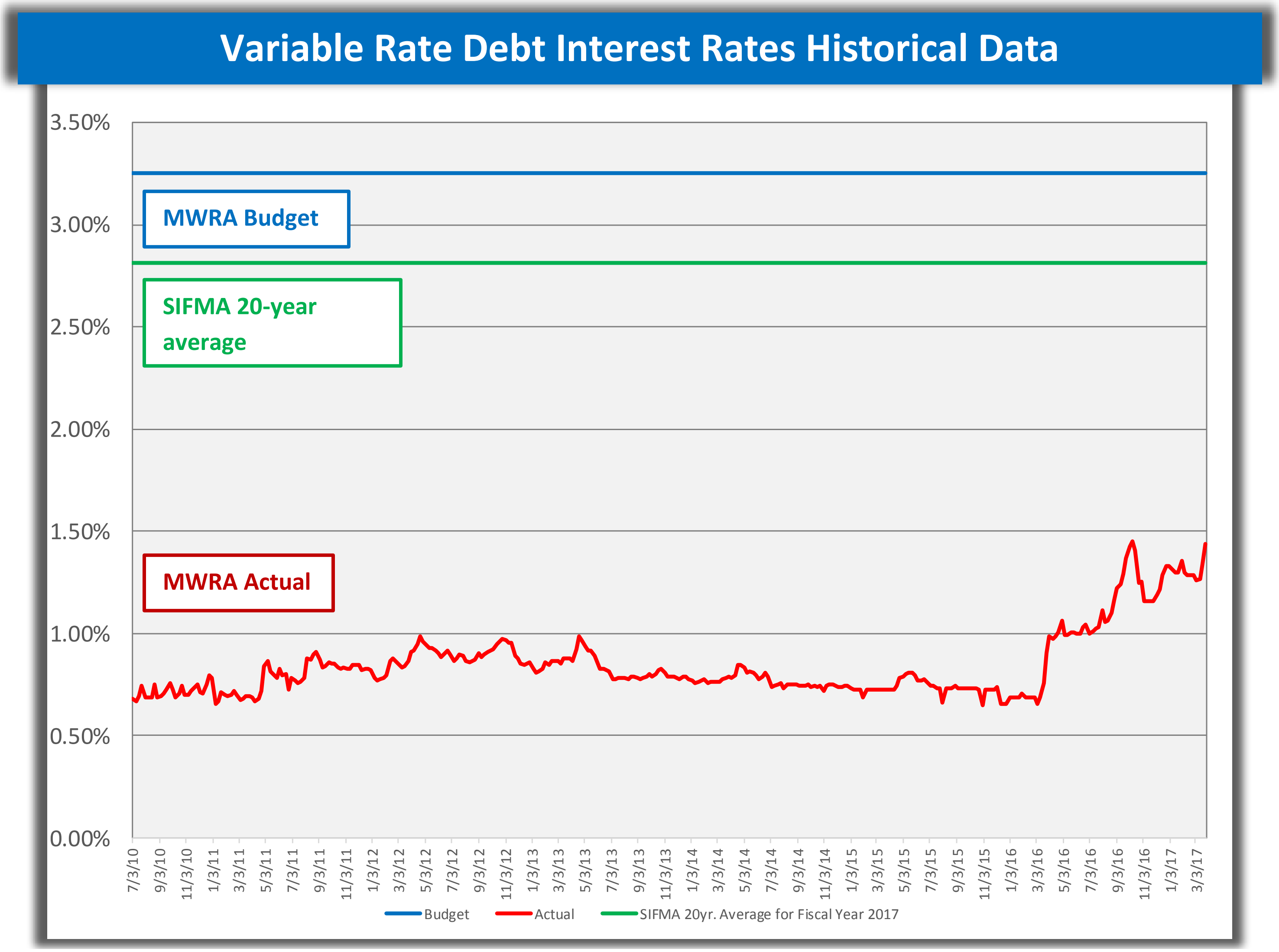

Figure 16

Figure 16 shows these recent increases in interest rates, beginning around April 2016. After seven years of historic lows, the Federal Reserve began raising federal funds rate in December 2015, and has raised it twice since, most recently in March 2017. As a result, interest rates in general are going up, and the Authority's VRD interest rates are no exception.

As a result, the Authority has proposed increasing its VRD interest rate assumptions from 3.25% to 3.5%. This 0.25% (25 basis points) increase has an estimated impact of $1.2 million, which the Authority has built into its proposed FY18 CEB.

The Advisory Board acknowledges that interest rates will likely go up; however, given the wide range between the MWRA's actual interest rates versus the budgeted amount, we believe increasing the VRD interest rate to be unnecessary.

As Figure 16 shows, the average difference between the 3.25% interest rate level and the MWRA's actual interest rate was about 2.5%. At an assumed interest rate of 3.25%, the MWRA has the capacity to absorb $8.6 million in increased costs from current VRD interest rate levels before going over budget in this line item. The down side of reducing this margin means the VRD surplus goes down making less available for defeasance; however, it is still likely that even with increasing interest rates there will be some surplus in this line item.

Should interest rates suddenly increase higher than 3.25%, the Authority has additional options built into its budget. As noted before, the Authority has proposed an optional prepayment of debt totaling $10.9 million. This debt new prepayment approach was approved by the Advisory Board as part of last year's budget review and serves a similar function to the defeasance. The distinction between debt prepayment and defeasance is simple: one is planned and budgeted, the other is a windfall of sorts, should conditions be favorable. Another key point to mention is that the debt prepayment funds are held until the end of the fiscal year, just in case they are needed for any unforeseen expenses that may arise. Again, using the 25 basis point equivalent, this means the Authority could absorb an additional 2.25% interest rate increase with these funds. Add this 2.25% to the margin of the VRD interest rate assumption, and the MWRA would have enough cushion to absorb rates as high as 5.5%. At the height of the market dislocation in FY 2008 – admittedly a highly irregular event – the MWRA's VRD interest rates peaked at 5.68%. The down side with using these funds is that the MWRA would lose the benefits of reducing future rate increases; however, prepayment benefits are only shown through FY19, so the long-term rate outlook would not change from current projections, which are generally under 4%.

As a final backup plan, the Authority also has $62.6 million in reserves for rate stabilization - funds that are not currently projected to be used until FY21. The down side with using these funds, is that it reduces a powerful tool the Authority has for strategically managing rates in difficult years, such as FY21 and FY22.

Maintaining a 3.25% VRD interest rate assumption gives the Authority a cushion to absorb up to $8.6 million in additional VRD costs. Given this cushion plus the backup options to repurpose the $10.9 million for optional debt prepayment or to use rate stabilization funds, the Advisory Board believes a 3.25% VRD interest rate assumption is still conservative budgeting. In all likelihood, there will still be some VRD surplus that can be used toward defeasance, even if the amount is lower than in previous years. The defeasance account strategy has worked very well for the Authority in recent years to prepay debt; however, **planned** debt prepayment is best budgeted in the optional prepayment line item, where its levels can be discussed and debated. Defeasance due to capital financing surplus should be a "happy accident" if conditions warrant. The Authority should not budget these line items with an aim to create a surplus for defeasance.

Therefore, the Advisory Board recommends reducing the variable rate debt interest rate assumption to 3.25%, and the variable rate debt line item by $1.2 million to reflect this change.

SRF Borrowings

- FY18 debt service on SRF borrowings: $87.0 million
    - $4.29 million of this is for Pool 21 new borrowings
    - These amounts may be updated in the final FY18 CEB
- Outstanding SRF debt: $980.10 million
    - 18.8% of total outstanding debt[12]

Bond Defeasance and Refunding

- Proposed FY18 CEB assumes a defeasance transaction with a principal amount of $31 million
    - $20 million from the projected FY17 surplus and $11.0 million from the Debt Prepayment included in the FY18 CEB
    - Total estimated benefit in future years: $38.4 million
        - Benefits are in FY18 through FY22
- Since 2006, through the proposed FY18 defeasance, MWRA will have defeased $521.2 million for targeted debt service reductions over multiple years. (See Figure 17)
- The Authority continues to look for opportunities for refunding and refinancing to reduce projected debt service

Impact of the FY06 – Proposed FY18 Defeasances

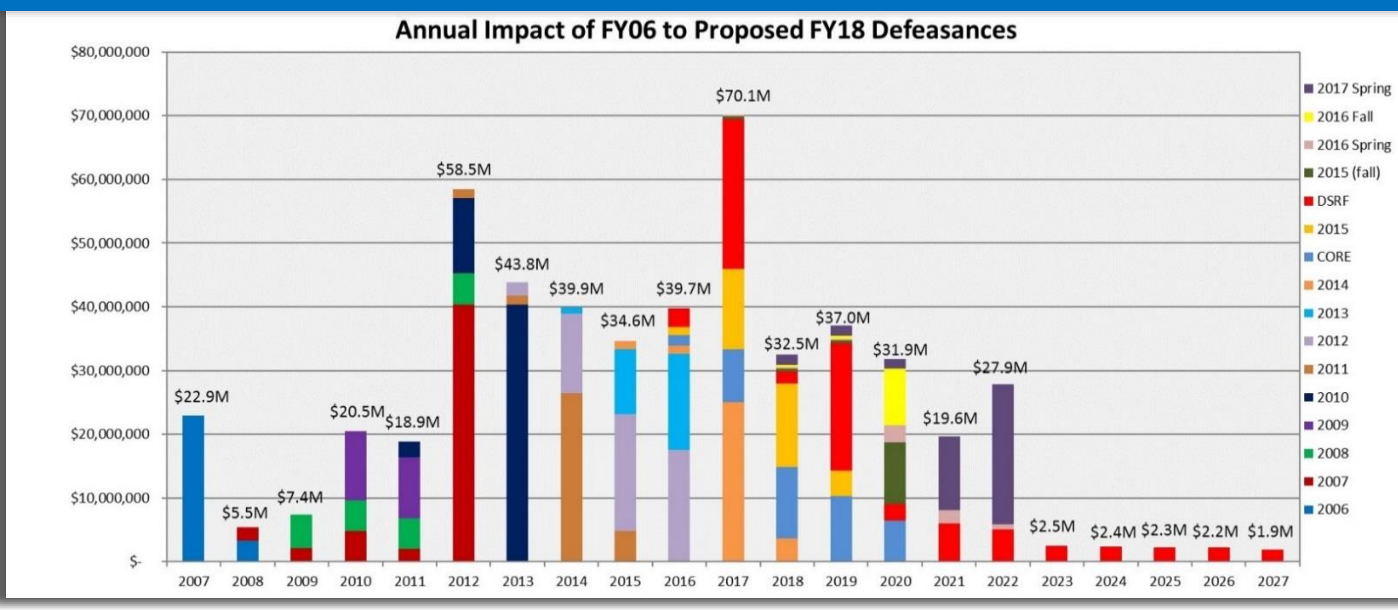

Figure 17

- The Board has authorized the continuation of the defeasance account to receive surplus funds raised for capital financing expenses to manage future rates. The account ensures that these funds are used in a manner consistent with the purpose for which they were budgeted and raised from the ratepayers.[13]

The Advisory Board supports the continued use of the defeasance account strategy, which clearly identifies a use of variable rate debt service savings that is consistent with the original intended use of the funds that were raised.

[12] As of June 30, 2016

[13] Figure 17 includes an assumed $20 million defeasance in the proposed FY18 CEB

The Advisory Board expects the Authority to reduce capital financing by an additional $2,190,769 to reflect the benefits of the spring 2018 defeasance transaction along with other new changes to capital financing.

Other Components of Capital Financing Expense

- Water Pipeline Commercial Paper: $4.09 million
  - Interest payments on commercial paper borrowings for:
  - Local Pipeline Assistance Program (LPAP)
  - Local Water System Assistance Program (LWSAP)
  - Assumptions include:
    - 3.50% interest rate
    - $149.0 million average balance of commercial paper outstanding
- Capital Lease Payment: $3.2 million
- Relating to capital costs of Chelsea administration and maintenance facilities; flat annual cost
- The amount has remained the same since 2002
- Annual lease costs, insurance, and taxes are included in the "Other Services" section
- Current revenue for the capital program: $13.2 million
- The FY17 budget was $12.2 million; the FY16 budget was $11.2 million
- Beginning in FY17, the Authority began debt prepayment to strategically target future years
  - FY17 debt prepayment: $11 million
  - FY18 debt prepayment: $10.9 million

Policy Point — Current Revenue for the Capital Program

"Pay Me Now or Pay Me Later"

As part of last year's review, the Advisory Board spent a considerable amount of time discussing Current Revenue for the Capital Program ("Pay-Go"). One rationale promoting the use of Pay-Go use was that certain expenses, though capital, did not have as long a useful life as others. It doesn't make sense to borrow long-term on an asset that is expected to be replaced in the short-term. Other uses identified for Pay-Go were expenses that were not eligible for tax-exempt funding. Two examples we cited were any safety improvements made to Pan Am's railroad over the Wachusett Reservoir, and the portions of the Lead Loan Program funding lead service removals on private property.

This year, another instance of work being done that is not eligible for tax-exempt funding has arisen; specifically, the new agreement with NSTAR and HEEC ("Eversource") regarding the installation of a new cross-harbor cable (For the full discussion on this agreement, see Policy Chapter, page 103). MWRA will be self-funding a portion of the new cable's installation; however, the cable is Eversource's property, and therefore cannot be funded with tax-exempt bonds. The MWRA, therefore, proposes to use Pay-Go to fund these costs. MWRA currently estimates costs at $48.25 million for the self-funded portion of the construction, with a completion date of December 2016. Using the Pay-Go funds as proposed in FY18 and projected in FY19-20, there should be adequate funds available for this purpose.

As we reiterate in the Policy Chapter (page xx), the Advisory Board supports MWRA's plan to use Pay-Go to fund the self-funded portion of the new cross-harbor cable construction; however, we emphasize that this is a one-time, special case endorsement of capital funds for this specific project, and should not be construed as a blanket approval to fund future capital projects with Pay-Go. Paying for assets that have a useful life of several years with cash makes us uneasy, since we believe in the concept of spreading the costs of a long-lived asset over time ("generational equity"). We reserve our right to review future uses of Pay-Go for capital projects.

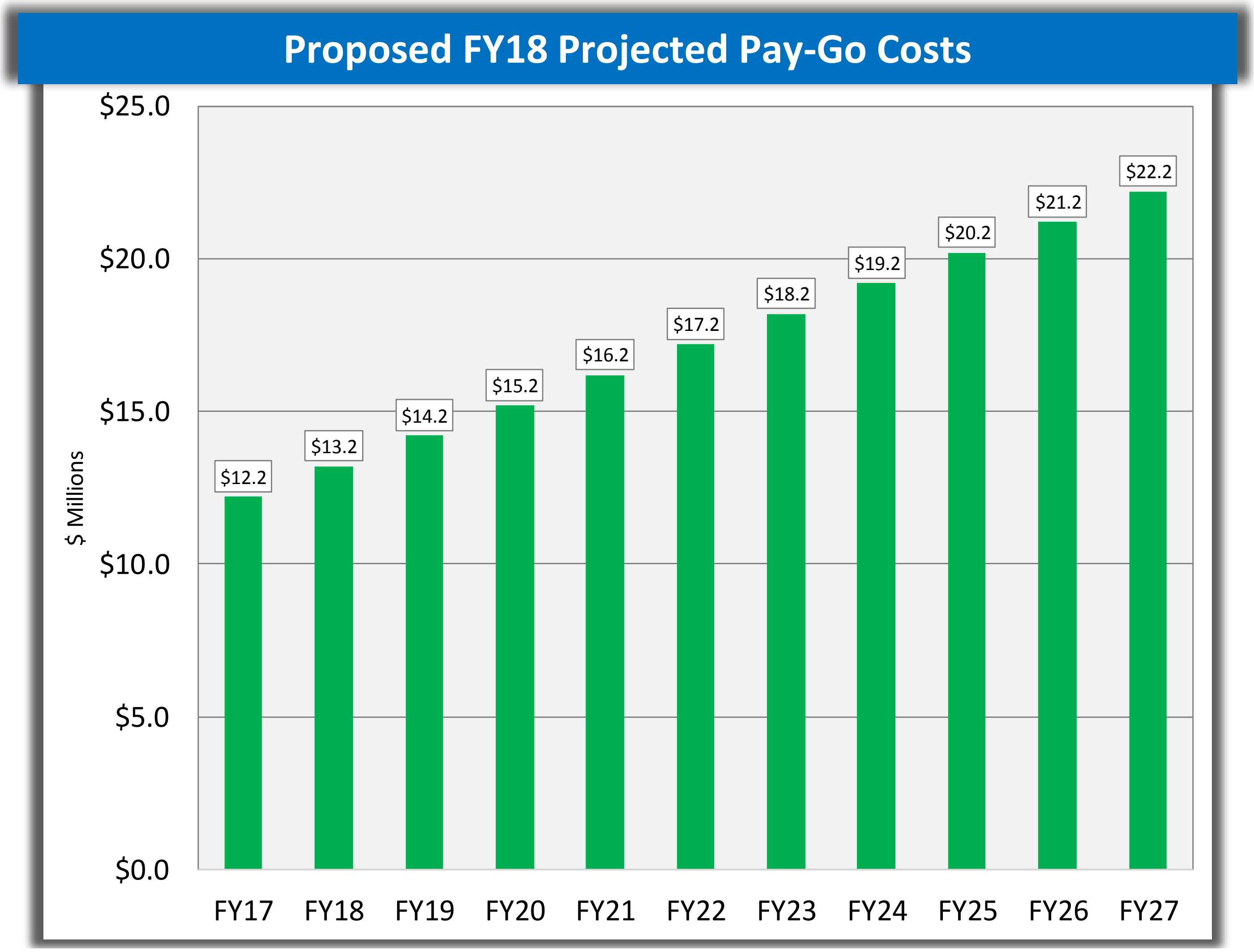

Figure 18

One of the big concerns in last year's review at the time had been a lack of clarity about what projects Pay-Go was funding. Dedicating Pay-Go toward the cross-harbor cable project effectively meets our recommendation from last year's review where we requested a more detailed accounting of the projects being funded by Pay-Go. We would like to see this accounting continue after this project is complete, when we expect Pay-Go will be used for multiple projects, as before.

The Advisory Board supports the MWRA's plan to use Pay-Go to fund its share of the new cross-harbor cable construction, currently estimated at $48.25 million.

The Advisory Board's only concern is that dedicating these Pay-Go funds over the next few years effectively "ties the Authority's hands" when looking to fund other needs that are not eligible for tax-exempt financing, such as the examples noted above. We reiterate our belief from last year that Pay-Go levels need to be tightly controlled until capital financing costs make up a significantly lower portion of the Authority's current expenses.

The Advisory Board recommends Pay-Go funding levels are not increased beyond those currently in the MWRA's planning projections. The Advisory Board reserves its right to recommend reduced Pay-Go levels in future.

Debt Service Offsets

- Bond redemption funds are treated as an offset to capital financing expense
  - No drawdowns are currently budgeted for FY18
  - Current balance: $26.1 million
- Debt Service Assistance funds from the Commonwealth have been a critical tool in managing sewer (and some water) revenue increases for MWRA communities
  - Proposed FY18 budget assumes $0 funding
  - Earlier, the Administration confirmed the funding of $1.1 million for the statewide capital debt service assistance program in the FY17 budget
    - After this funding was cut, it was restored and the Authority received its share ($391,580) in May 2017

In keeping with the policy regarding Debt Service Assistance advocated by the Advisory Board to "Pay It Forward" to the next budget year, the Advisory Board recommends that $391,580 be used to directly reduce the rate revenue requirement for FY18.

Longer Term Outlook for Principal and Interest Payments

- Debt Service payments increase rapidly in the coming years and are currently projected to peak in about FY 2023
- Current projections indicate that debt service payments will not return to today's levels until about 2031
- FY18 debt service: $469 million
  - FY18 principal: $213 million
  - FY18 interest: $229 million
- FY23 debt service: $576.4 million

CIP Spending vs. Capital Financing Repayment

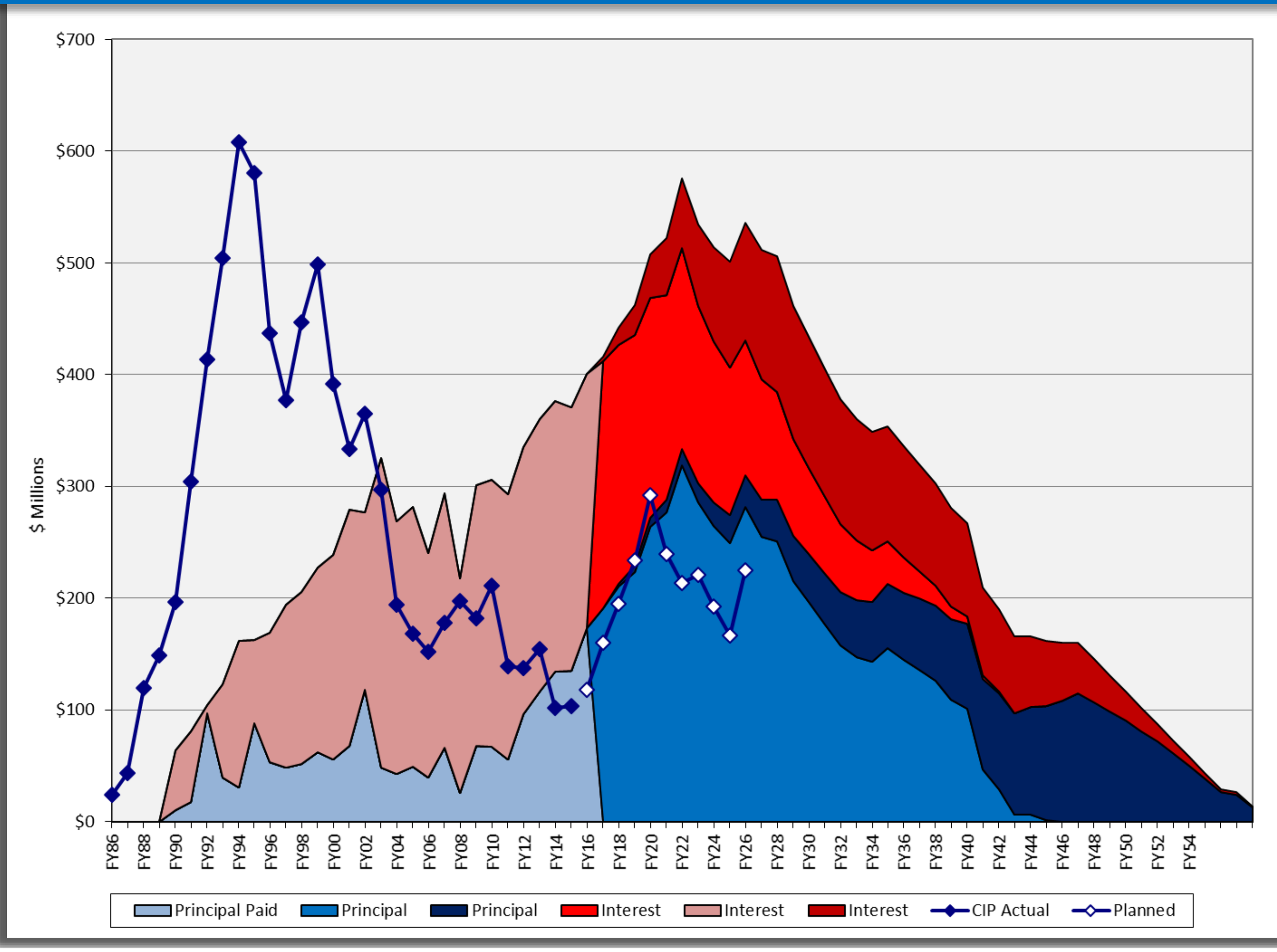

Figure 19

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Personnel Expenses

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Regular Pay	$100,018,443	$103,027,311	$3,008,868	3.0%
Regular wages and salaries for full- and part-time employees.				
Other Pay	1,840,455	1,754,538	-85,917	-4.7%
Includes shift differential, holiday pay, temporary employees, interns/co-ops, and stand by pay.				
Wages and Salaries Subtotal	101,858,898	104,781,849	2,922,951	2.9%
Fringe Benefits	20,242,323	21,515,134	1,272,811	6.3%
Includes health insurance, dental insurance, Medicare, and all other fringe benefits.				
Overtime	4,192,676	4,507,277	314,601	7.5%
For planned maintenance, emergency, and coverage.				
Workers' Compensation	2,344,190	2,322,980	-21,210	-0.9%
Includes compensation payments, medical payments, and other related costs.				
TOTAL PERSONNEL EXPENSES	**$128,638,087**	**$133,127,240**	**$4,489,153**	**3.5%**

Table 28

Other Highlights

- Wages and salaries expense include an estimate of FY18 COLA increases.
- Average funded staffing level: 1,150
- FY17 budgeted level: 1,150
- Fringe benefits expense increased mainly due to the reported increase from the GIC; calculations are based on current enrollment.
- More and more employees are opting for individual health insurance plans rather than family plans
- Workers' compensation expense is based on a three-year average of actual spending.

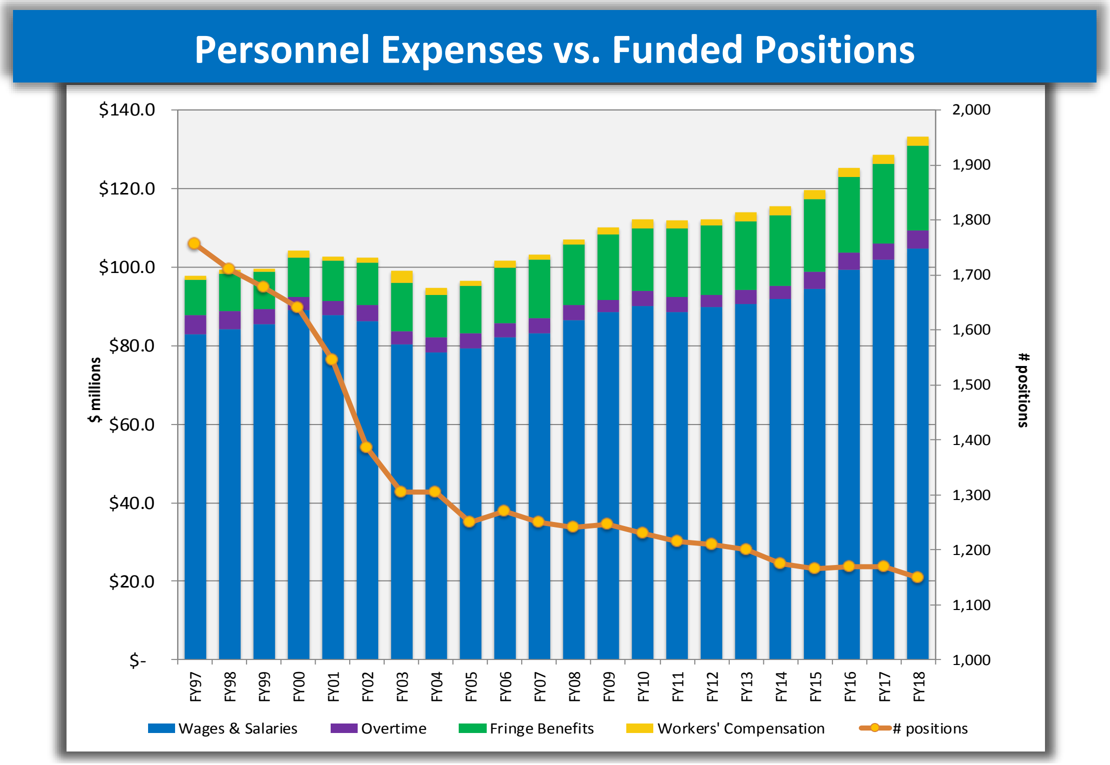


Figure 20

"Delta Report" Personnel Expenses Increase $4.5 Million

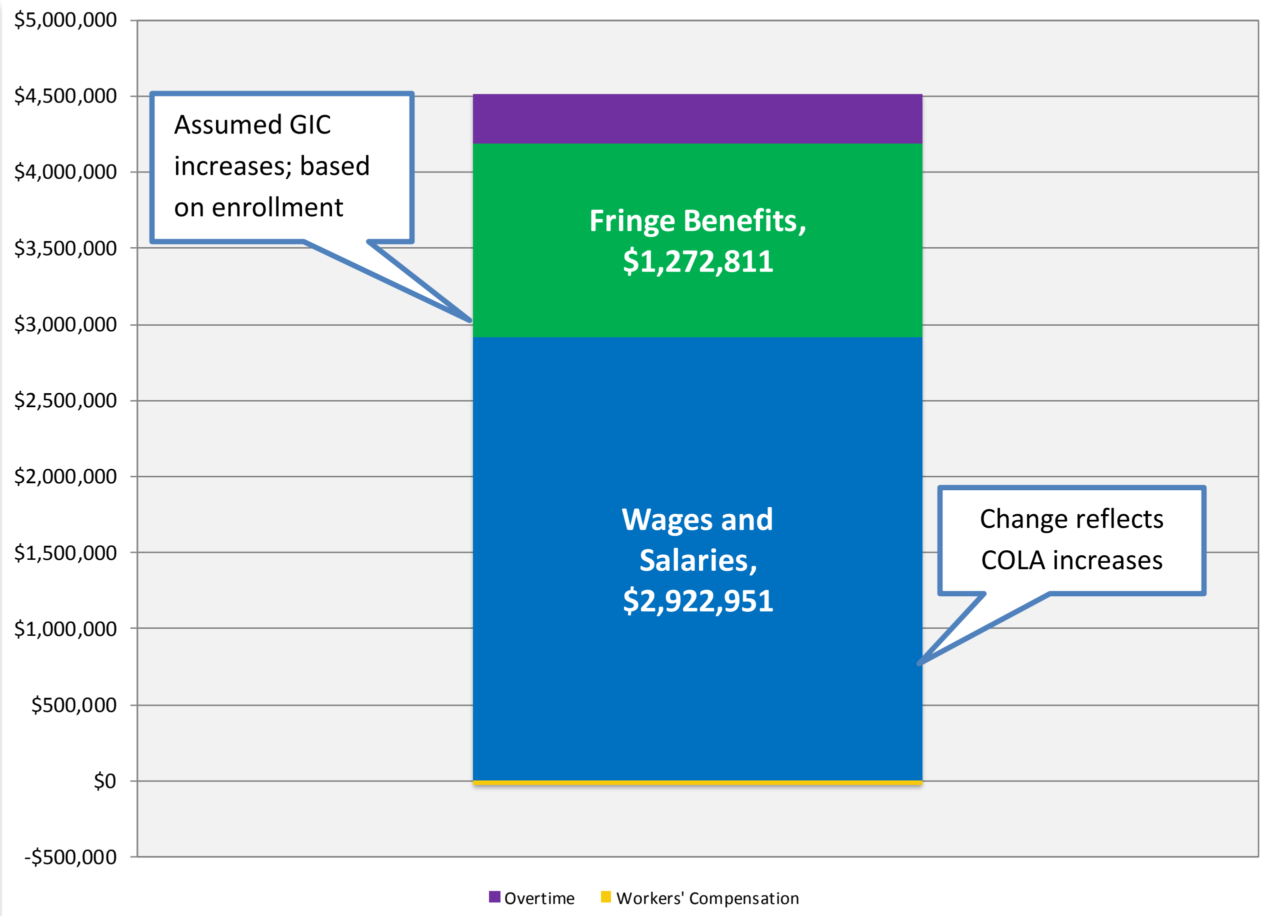


Figure 21

- Staffing levels have decreased by over one-third since 1997
- Proposed FY18 = 1,150 FTEs
- Total Reduction: 607 positions
- March 2017 staffing level: 1,137 FTEs
- New hires tend to begin at lower pay-rates than the incumbents, helping to contain costs
- New hires pay a higher percent of health insurance premiums, reducing fringe benefits costs

Wages and Salaries

- Increase from FY17: +$2.9 million (2.9%)
- Union contracts are currently being negotiated and may impact the final FY18

The Advisory Board expects the MWRA to propose an increase of $4,522 in the "wages and salaries" category of expenses in its final FY18 CEB.

Due to the lag time inherent in backfilling vacancies, the Advisory Board recommends that the Authority adjusts its attrition/vacancy rate assumptions upward by $1,000,000 (includes associated fringe benefits).

- To put this recommendation in perspective: through March 2017, the Authority was underspent in personnel expenses by about $3.7 million.
- To support the Lead Loan Program, in FY17 the Authority hired temporary employees to provide additional lab services resources for member communities; these positions will continue at least partly through FY18, with either school lead testing, Clinton, or a combination.

Consistent with last year's recommendation, the Advisory Board supports continued funding for proposed temporary staffing related to the lead program to assist communities.

Fringe Benefits

- Fringe benefits make up 16.2% of total Personnel-related expenses.

Based on new data released this spring from the GIC, MWRA projects a decrease of $414,159 from the proposed FY18 CEB. The Advisory Board expects this reduction to be included in the final FY18 CEB.

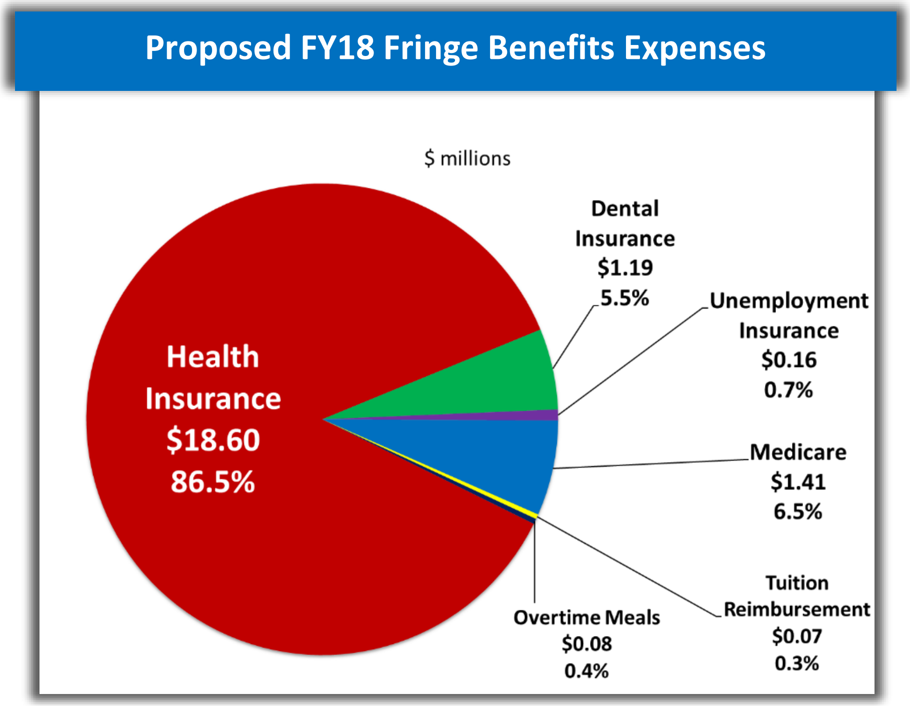


Figure 22

Overtime

- Increase from FY17: +$314 thousand (+7.6%)
- Largest driver: maintenance ($840 thousand, a 33% increase) for Deer Island, including:
  - $206 thousand for storm coverage
  - $468 thousand for HEEC relocation coverage
    - HEEC protection project costs have continued to evolve over the recent months. See Policy Chapter, page 104 for detailed discussion on these costs

Largely due to a change in approach on the cross-harbor cable protection project (see Policy Chapter, page 104) The Advisory Board expects the MWRA to reduce its overtime budget by $396,641.

Workers' Compensation

- Based on a three-year average of costs (FY14-16 = $2,322,980)
- Average spending has been $2.2 million since FY 2010, but varies from year to year
- Factors include number and severity of cases, increases in medical expenses over the years and settlements reached.
- MWRA staff administer the program including processing and monitoring injured employees' claims, coordinating claims investigations, working with injured employees to return them to work, and attending hearings at the Department of Industrial Accidents
- MWRA is self-insured
- Authority uses services of a third-party administrator for claims management, utilization review, payment processing for lost time compensation and payment of medical bills

- Annual budget includes actual expenses for weekly compensation payments to injured employees for lost time, payments for medical care, and other expenses (DIA hearing fees, medical examinations costs and investigation services)
- The budget also includes reserves for each workers' compensation claim (both compensation for lost time and medical expenses) which represent the estimated future liability for each claim

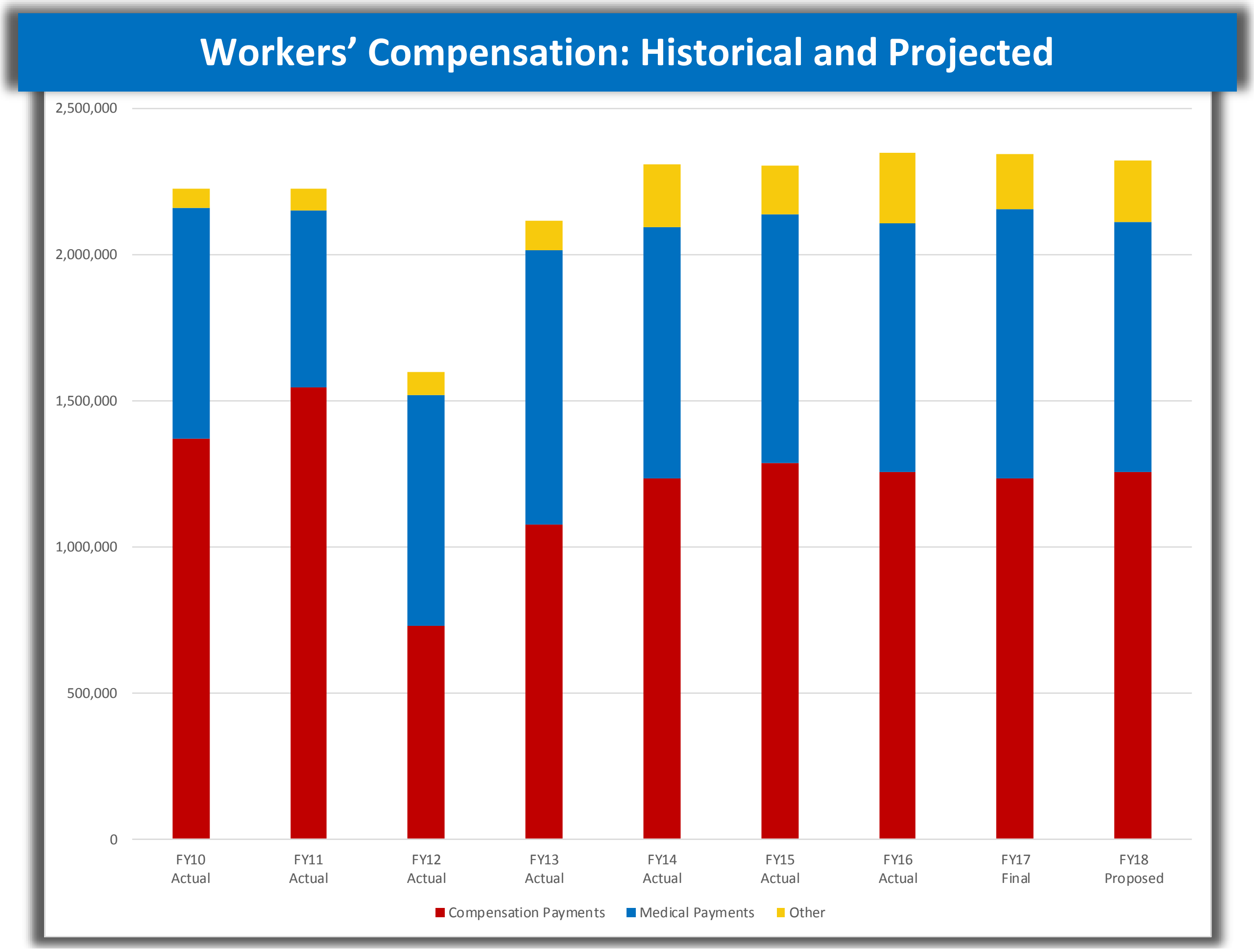


Figure 23

- MWRA maintains ongoing safety and training programs to promote and maintain a safe work environment, including confined space entry, trench safety, ladder staging, evacuation training and electrical safety, plus safe lifting training
- Light duty assignments are also utilized
- The Authority reports regularly on injury and illness rates as well as highlights of the workers' compensation program (including light duty returns), in the quarterly Orange Notebooks

Indirect Expenses

Line Item/Description	Final FY17	Proposed FY18	Δ ($s)	Δ (%)
Pension	$4,632,624	$5,077,369	$444,745	9.6%
Scheduled updated contribution to retirement fund. Required annual contribution = $3.3 million.				
Post-Employment Benefits	4,876,050	5,035,422	159,372	3.3%
All other benefits for retirees (e.g. health insurance).				
Insurance	1,997,898	2,113,452	115,554	5.8%
Insurance and payments/claims.				
Mitigation Payments	1,558,000	1,596,950	38,950	2.5%
Mitigation payments to Quincy and Winthrop.				
HEEC Payments	773,859	670,978	-102,881	-13.3%
Cross-harbor cable to Deer Island				
Watershed Reimbursements	24,291,268	25,024,006	732,738	3.0%
Supports the operations and related costs of the state's Department of Conservation and Recreation, Office of Watershed Management.				
Additions to Reserves	-167,742	2,062,526	2,230,268	1329.6%
1/6th of all planned Operating Expenses.				
TOTAL INDIRECT EXPENSES	**$37,961,957**	**$41,580,703**	**$3,618,746**	**9.5%**

Table 29

Other Highlights

- Pension is 98.3% funded (as of January 2017)
- "Virtual Full Funding" is an industry term that recognizes how difficult it is to get to exact 100% funding of the pension liability; it is considered to be between 95% and 105% funded
- FY18 Pension annual required contribution (ARC) of $3.3 million is based on:
  - A valuation report as of January 2015
  - A FY24 schedule for reaching full funding
- Other Post-Employment Benefits (OPEB) combined with pension obligations are treated as one total liability, with funding for OPEB contingent upon pension full funding
- MWRA proposes $1.8 million in an optional pension payment to offset recent investment losses
- Insurance expense based on anticipated market conditions
- Costs of the Division of Watershed Management are treated as a reimbursement to the state and include PILOT payments and debt service on watershed land purchases, as well as direct operating expenses
- HEEC payments for O&M and debt service charges declined $102.9 thousand (13.3%). The funding component for the cable capital investment ended in May 2015; O&M charges continue

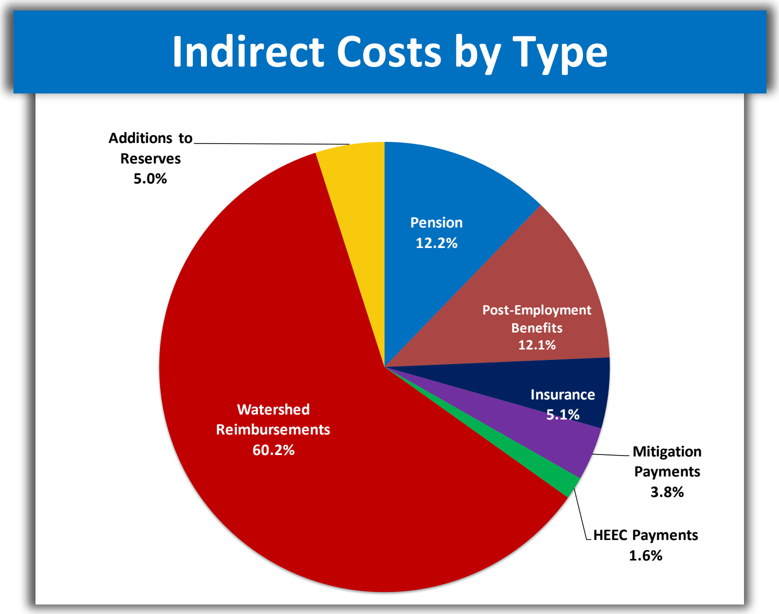


Figure 24

"Delta Report" Indirect Expenses Increase $3.6 million

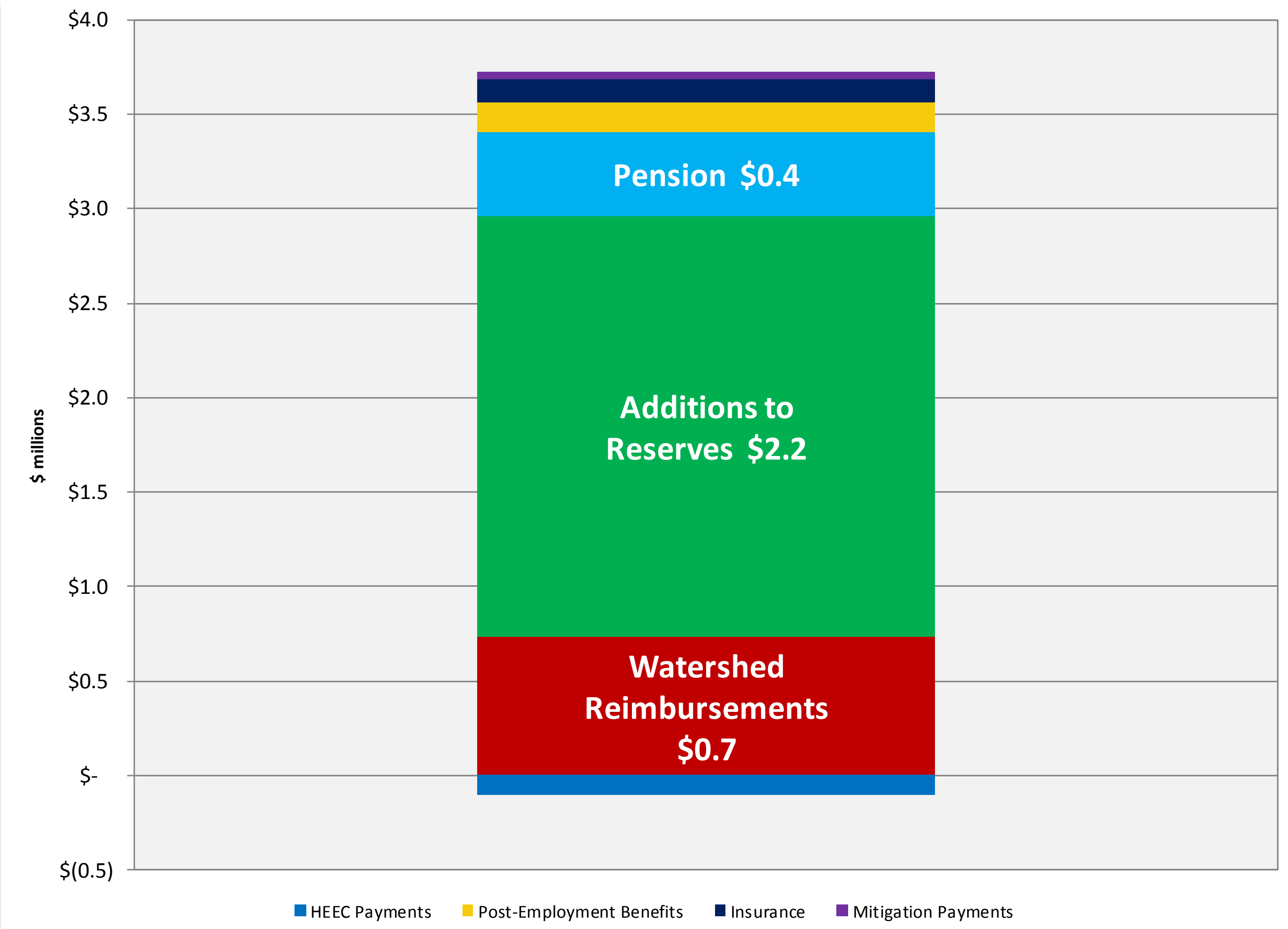


Figure 25

Other Post-Employment Benefits (OPEB) and Pension

- Retirement fund is still on track to be fully funded by 2024
- FY17 pension/OPEB expense: $9.5 million
  - $3.1 million = annual required contribution
  - $1.5 million = optional pension contribution
  - $4.9 million = optional OPEB contribution
- Proposed FY18 pension/OPEB expense: $10.1 million
  - $3.3 million = annual required contribution (ARC)[14]
  - $1.8 million = additional pending deposit, optional, to pension fund
  - $5.0 million = optional OPEB contribution
- Governmental Accounting Standards Board (GASB) Statement No. 45 governs the accounting and financial reporting of OPEB
  - Governmental entities are not currently required to fund OPEB
  - All entities comply with GASB 45 by accounting and reporting on its OPEB liability
- The Authority has met all current provisions of GASB 45

[14] Based on January 2015 actuarial report

Policy Point

Pension/Other Post-Employment Benefits

"Don't Make a Bigger Pie"

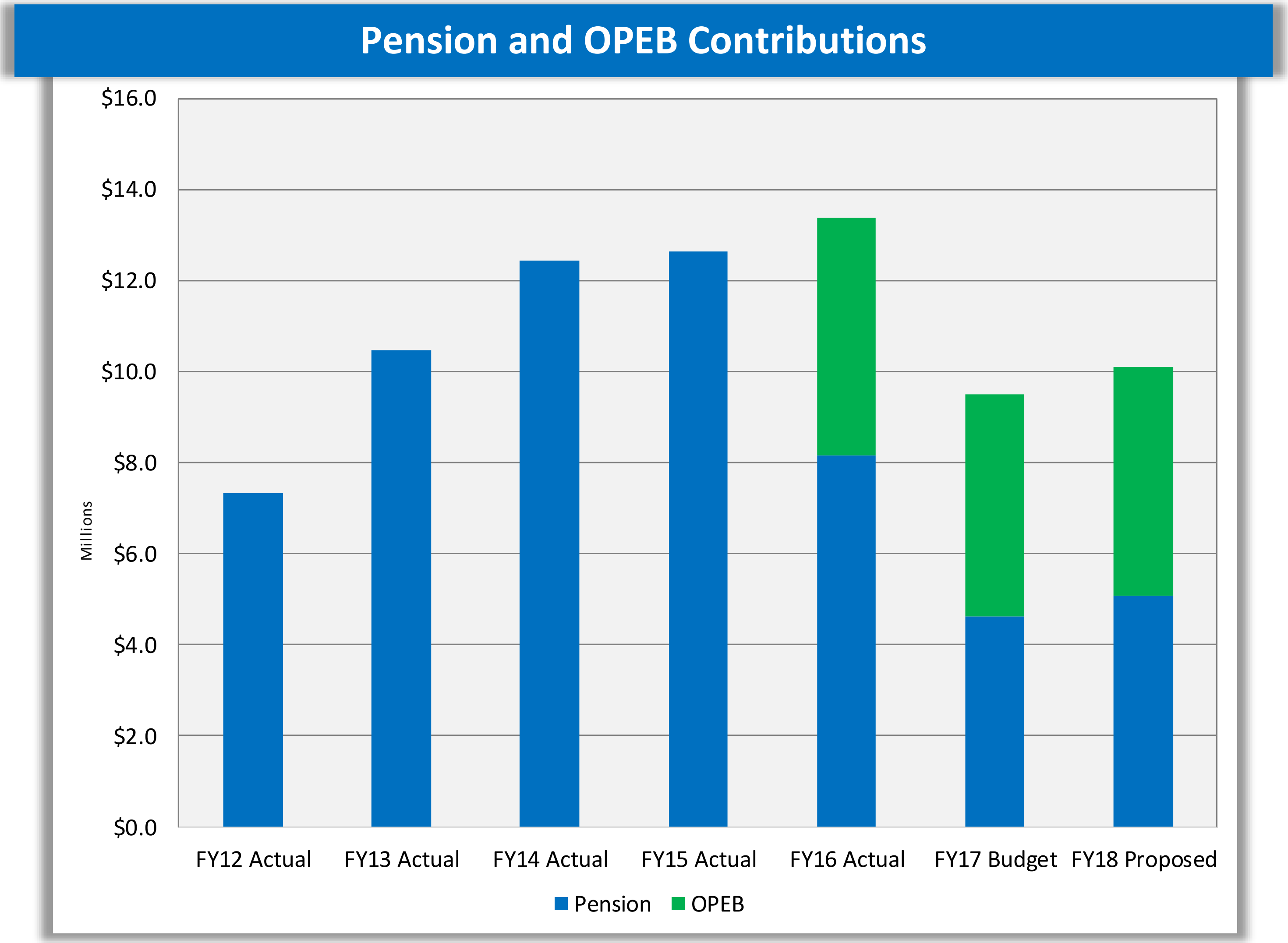


Figure 26

Years ago, the Authority put forward an approach toward the pension and OPEB liabilities that treated each as "two sides of the same coin," combined with an aggressive approach to fully fund the pension before addressing the OPEB liability, an approach the Advisory Board supported. In fact, this "one total liability" approach to pension/OPEB liability led to the "virtual full funding" of the pension in FY 2016. Consistent with the adopted strategy, the MWRA then began funding its OPEB liability at a level of 50% of the Actuarial Calculated Contribution (ACC)[15].

Recently, the pension fund has taken some losses on its investments. Because the MWRA uses a multi-year "smoothing" approach, the impacts of these losses are spread over a five-year period; however, the MWRA has included an additional payment of $1.8 million beyond the retirement fund's annual required contribution (ARC) to help address these losses.

To put this in context, the pension's ARC for FY18 is about $3.3 million, and the standard 50% of OPEB's ACC contribution totals about $5 million. Together, funding this "one total liability" according to the original tried and true strategy should

[15] Although the Authority refers to the OPEB contribution recommended in the actuarial study as an ARC, similar to the pension, the Advisory Board has adopted the ACC nomenclature to emphasize the fact that OPEB contributions are not, at this time, required by law.

total about $8.3 million; however, the MWRA's proposed FY18 CEB diverts over $10.1 million toward this liability when including the optional pension payment.

First, let's clarify what the MWRA is obligated to pay. The only amount the Authority is required to pay is the Annual Required Contribution for the retirement fund ($3.3 million). Funding OPEB at 50% of the ACC ($5 million) is a strategy that addresses the very real liability of other post-employment benefits; however, there is no legal requirement to fund this liability. The Advisory Board has agreed to the current funding strategy as a reasonable balance between the OPEB liability and the annual costs to communities. The additional pension payment of $1.8 million is not an obligation but an optional payment.

Second, let's reiterate the Authority's approaches to both losses and gains on pension returns. By employing a five year "smoothing" approach, losses are reflected in pension costs, but are done so over a five-year period to eliminate significant swings in annual payments. So, basically the Authority already employs a mechanism to fund these losses - one which helps to minimize year-to-year increases in costs to the communities.

Third, let's also clarify that the pension's "full funding" status is not in jeopardy due to these losses. As noted in previous year's *Comments and Recommendations*, the Authority adopted industry standards identifying the range of 95%-105% as "virtual full funding" of the retirement fund. Even with the recent losses, the Authority is comfortably within this range, which means this additional payment is not necessary to maintain virtual full funding.

Finally, we point out that not only is this a shift in the ratio of pension versus OPEB contribution, but also an overall increase to the size of the "pie." If we subscribe to the Authority's "one total liability" approach we can see that the liability was focused on the retirement fund for years, before it finally shifted focus toward the OPEB liability. Indeed, according to the original strategy, this year's contribution featured about a 40/60 pension/OPEB split. This split is based on a total combined contribution of $8.3 million. The proposed FY18 CEB, however, not only shifts the split closer to 50/50, but it also increases the total pie's "size" to $10.1 million. That's a 20% increase in costs, to address something that already employs a strategy specifically designed to minimize increases from year to year.

The Authority has often used the analogy of "two sides of the same coin" but perhaps a more appropriate one now is "two pieces of the same pie." Under this new visual, the Advisory Board's argument is simple: change the size of the slices as needed, but don't make a bigger pie. If MWRA wants to address pension fund losses, so be it. But do it by redirecting funds from the OPEB contribution rather than adding more funds to the total liabilities.

Consistent with the "one total liability" approach, and recognizing the combined costs of the agreed upon strategy, the Advisory Board recommends eliminating the $1.8 million additional pension payment. The Advisory Board leaves it to the MWRA's discretion whether or not to redirect $1.8 million of the OPEB contribution to address recent losses to the retirement fund.

Insurance

- Claims expense, proposed at $0.4 million, is based on a five-year average
- Premiums expense, proposed at $1.71 million, is based on anticipated market conditions
- Insurance program is out for bid with award anticipated spring 2017
    - Has been on an annual renewal schedule, though multi-year bids are currently being reviewed

Additions to Reserves

- The Operating Reserve level requirement: 1/6th of all designated expenses
    - Proposed FY18: $2.1 million

- Final FY17: -$168 thousand

The Advisory Board recommends reducing the "additions to reserves" line item for FY18 by $1,259,061 to correspond to the recommended reductions in eligible line items.

Watershed Reimbursement

- Other costs relating to watershed management have been added in recent years to both the Authority's CEB and CIP budgets. These include funding for new acquisition of watershed lands, dam repairs and PCB removal, as well as dam inspections and invasive species surveys and control
- In FY16 the MWRA paid off remaining watershed debt service totaling $32 million
  - Up until this point, the payments had been evenly spread at $5.6 million/year
  - There will be no more spending in this line item moving forward

The Advisory Board expects the MWRA to reduce the Watershed Reimbursement line item by $160,000.

Table 30

Watershed Reimbursement				
Categories	**FY17 Budget**	**FY18 Proposed Draft**	**Δ ($s)**	**Δ (%)**
Operating Expenses	$16,024,268	$16,664,006	$639,738	4.0%
Debt Service	0	0	$0	-
Payment in Lieu of Taxes (PILOT)	8,372,000	8,600,000	228,000	2.7%
SUBTOTAL (Expenses)	$24,396,268	$25,264,006	$867,738	3.6%
Revenue	1,015,000	990,000	-25,000	-2.5%
TOTAL (Revenue Deducted)	$23,381,268	$24,274,006	$892,738	3.8%
Proposed Watershed Capital Budget A capital budget has been proposed for the watershed beginning formally in FY17. This is separate from the Watershed Division's operating budget.				
Capital Projects	910,000	1,050,000	140,000	15.4%
TOTAL	**$24,291,268**	**$25,324,006**	**$1,032,738**	**4.3%**

Table 31

Watershed Revenues				
Categories	FY16 Budget	FY17 Proposed Draft	Δ ($s)	Δ (%)
Interment Fees	$0	$0	$0	-
Fish & Boating/Deer Hunt	240,000	240,000	0	0.0%
Rents	0	0	$0	-
Forestry Sales	185,000	200,000	15,000	8.1%
Miscellaneous	50,000	50,000	$0	0.0%
Prior Year Refunds	0	0	$0	-
Hydropower/Tr Lines	540,000	500,000	-40,000	-7.4%
TOTAL	**$1,015,000**	**$990,000**	**-$25,000**	**-2.46%**

- Watershed revenues function as an offset to the total Watershed Reimbursement.

Policy Point

Watershed Capital Budget

"Conservation versus Recreation?"

Because watershed issues have been an increasingly "hot button" issue for the MWRA, DCR, DWSP, MassDEP, and EOEEA, breaking from our standard approach, the Advisory Board will begin this policy discussion with our recommendation, and then follow with the line of reasoning that takes us to this point.

Last year, DWSP put forward a recommendation for a newly formed capital budget to address some of its larger needs – needs that had either been addressed piecemeal or ignored to date. In response, the Advisory Board put forward a series of recommendations that urged a premeditated approach to identify and fund capital projects as capital expenses rather than current expenses. Last year's recommendation endorsed the creation of a capital budget and stated:

The Advisory Board supports the creation of a capital budget for the Watershed Division subject to the following conditions:

- **The Watershed Division must implement a formal capitalization policy to clearly identify whether projects should be funded through the Watershed Operating Budget or the new capital budget.**
- **The MWRA and Watershed Division should work together to develop criteria on the agency's working relationship on managing capital projects using a tiered approach where some projects are managed by MWRA and some by the Watershed Division. The MOU should be revisited and modified in any way needed to implement this approach.**
- **Any projects that meet this capitalization threshold should be removed from the DCR operating budget.**
- **MWRA must receive a detailed and realistic five-year capital spending plan.**

- **DCR must implement a five-year capital spending cap for the Watershed Division similar to the MWRA's spending cap. If DCR's capital spending is funded through MWRA's CIP, these projects will count toward the MWRA's capital spending cap.**

The Advisory Board believes first and foremost an appropriate capitalization policy is critical for DWSP to move forward. MWRA ratepayers should not be paying cash for projects, which under the MWRA's capitalization policy would be paid over 30 years. Not only is this shaky financial practice – assets with long lives should be funded over time for generational equity among other reasons – but it could and will also cause rate issues if cash-funded.

The Advisory Board recognizes the challenges in the structure of the relationship between DWSP and the MWRA - in many cases, the MWRA would be capitalizing an asset that they do not own or seemingly do not have "primary control" over. To this, we encourage MWRA and DWSP to be creative. One option Advisory Board staff has floated toward this end is the option of MWRA purchasing an asset and leasing it back to DWSP for a nominal annual fee. This type of practice is often used by municipalities with great benefit. Another option is to change the Memorandum of Understanding between MWRA and the Commonwealth to better address the new capital investments that DWSP needs, and the MWRA is responsible for funding.

The second issue the Advisory Board is flagging relates to the out and out mixed messages being sent at the senior levels of management at DCR. In contrast, and as has been noted many times in Op-Eds by the Advisory Board's Executive Director as well as official publications such as this Just the FAQs video, the Advisory Board is adamant and unwavering in its belief that watershed lands are just that: lands designated to protect the drinking water of 2.5 million people within the Commonwealth.

Expansion of recreational activities of watershed lands that are 100% paid for by ratepayers to the tune of $136 million could jeopardize our filtration waiver and the quality of our drinking water. We will and have paid for watershed improvements and for additional lands to protect this high-quality source water. We will, however, not pay for improvements or more lands if DCR believes that these lands are equally recreational. Toward that end, the Advisory Board has proposed a third-party study be conducted to determine the effects of various off-trail activities in the watersheds. The silence has been "deafening" on our proposal.

Maintenance Expenses

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Buildings and Grounds Expense Materials and services for maintaining buildings and grounds.	$4,537,185	$4,619,591	$82,406	1.8%
Automotive Expense Materials and services for maintaining vehicles.	668,000	668,000	0	0.0%
Plant and Machinery Expense Materials and services for maintaining plant and machinery expenses. (E.g. drive chains, facility painting and coating)	12,282,879	13,360,104	1,077,225	8.8%
Pipeline Expense Materials and services for maintaining pipeline.	1,648,102	1,648,307	205	0.0%
Specialized Equipment Expense Materials and services for specialized equipment. (E.g. grit screens, lab equipment repairs, sewer bucketing equipment)	3,865,229	4,555,285	690,056	17.9%
Computer Expense Includes materials services, software licenses, and upgrades.	4,242,299	3,966,697	-275,602	-6.5%
Electrical Expense Materials and services for maintaining electrical systems.	2,675,050	2,432,400	-242,650	-9.1%
All Other Maintenance Expense Includes HVAC materials and services and purchase cards.	1,161,897	1,245,996	84,099	7.2%
TOTAL MAINTENANCE EXPENSE	**$31,080,641**	**$32,496,380**	**$1,415,739**	**4.6%**

Table 32

Other Highlights

- FY18 proposed spending ($32.5 million) is the highest since 2010
- Largest driver: plant and machinery expense
- Maintenance expense is 13.6% of all direct expense
- Deer Island maintenance: $13.7 million
- Field Operations maintenance: $12.4 milli including:
  - CWTP
  - Headworks
  - CSO facilities
  - Water and wastewater pump stations
- Other Operations Division maintenance expenses:
  - Clinton WWTP: $0.52 million
  - Laboratory Services: $0.35 million
- All other maintenance expense: $5.52 million
  - Makes up 17.0% of all maintenance spendi and includes:
    - MIS: $3.8 million
    - Fleet maintenance: $0.7 million
- Residuals Maintenance is now funded in the CIP
- Maintenance needs are also funded through the technical assistance group of engineering contracts and through the capital program

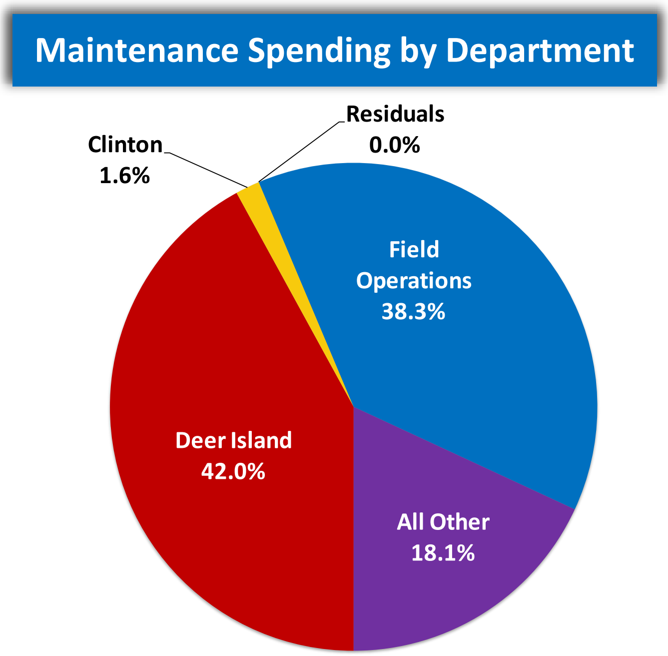


Figure 27

"Delta Report" Maintenance Spending Increases $1.4 Million

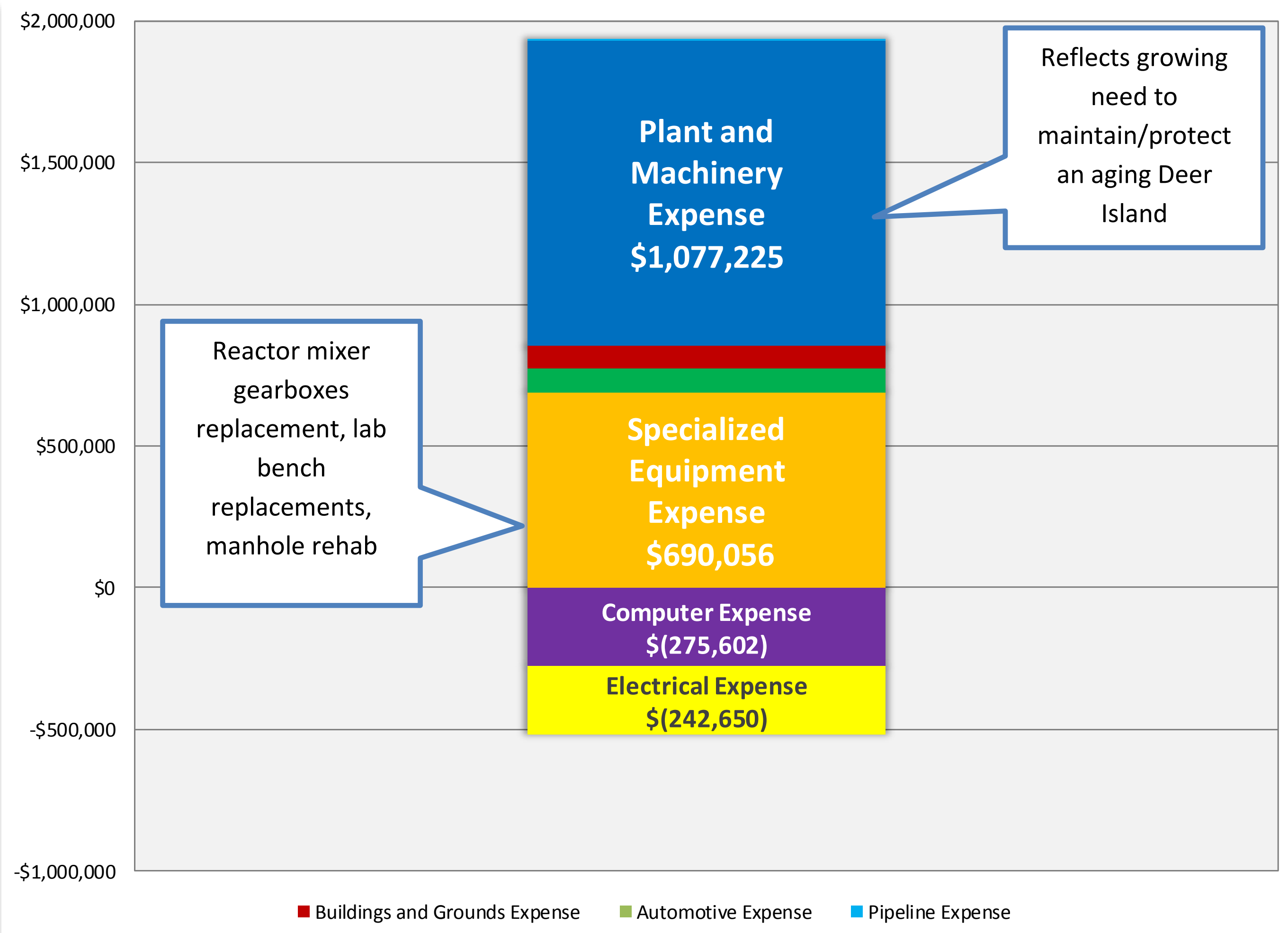


Figure 28

Deer Island Maintenance Totals $13.67 Million

- Materials: $5.85 million
  - 43% of the department's maintenance budget
- Services: $7.82 million
  - 57% of the department's maintenance budget
- Deer Island maintenance spending remains essentially the same
- Plant and machinery services and materials: $8.48 million
  - Makes up 62% of all Deer Island maintenance expense
- Electrical system maintenance: $1.87 million
- Buildings and grounds work: $1.57 million
- Some of the largest projects or contracts include:
  - Boiler maintenance: $1.00 million combining
    - Boiler maintenance
    - Hydro maintenance
    - Steam turbine generator (STG) maintenance

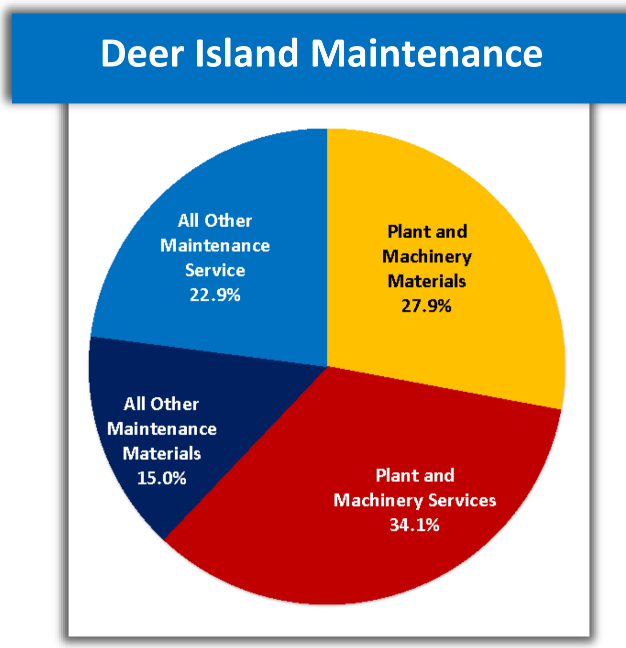


Figure 29

- Facility Painting and Coatings: $0.6 million
- Cryogenic Maintenance Services: $0.50 million
- Medium/Low Voltage Service: $0.48 million
- Janitorial Services: $0.45 million
- PICS Upgrade: $0.4 million
- PICS Maintenance: $0.39 million
- Combustion Turbine Generator (CTG) maintenance: $0.34 million
- Pipe Cleaning: $0.30 million
- Exterior Door Replacements: $0.30 million
- DITP Door Replacements: $0.3 million
- CTG Outside Louvers and AVR: $0.3 million
- Contractor Services Cable Relocation: $0.3 million

Field Operations Department (FOD) Maintenance Totals $12.4 Million

- FOD maintenance spending increases by $1.04 million (+9.1%) from FY17, comprised of:
  - Major projects increase: $1.14 million (+46%)
  - Services contracts decrease: -$26 thousand (-1%)
  - Energy initiatives decrease: -$0.16 million (-26%)
  - Day-to-day needs increase: +$88 thousand (+2%)
- Budget includes:
  - Day-to-day needs: $4.9 million
  - Service contracts: $3.5 million
  - Major projects: $3.6 million
  - Energy initiatives: $0.45 million
    - Includes HVAC and lighting efficiency upgrades

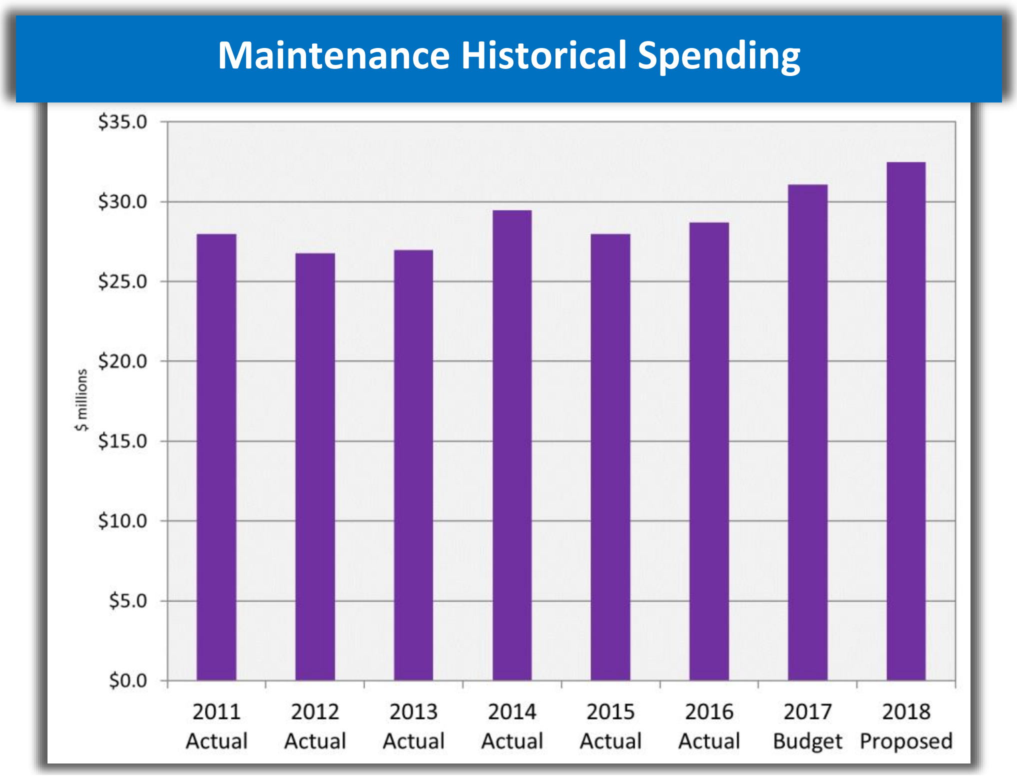


Figure 30

Clinton Wastewater Treatment Plant (CWWTP) Maintenance Totals $524 Thousand

- Increase from FY17: +$54 thousand (+11%)
    - Driven by $30 thousand increase for HVAC maintenance
- Includes $250 thousand for painting to address issues with the aerated grit tank
- Remainder of the budget is for routine materials and services
- Maintenance represents 25.2% of the FY18 proposed budget for CWWTP

The Advisory Board expects the MWRA to decrease its "maintenance" category of expense by $295,595 in the final FY18 CEB.

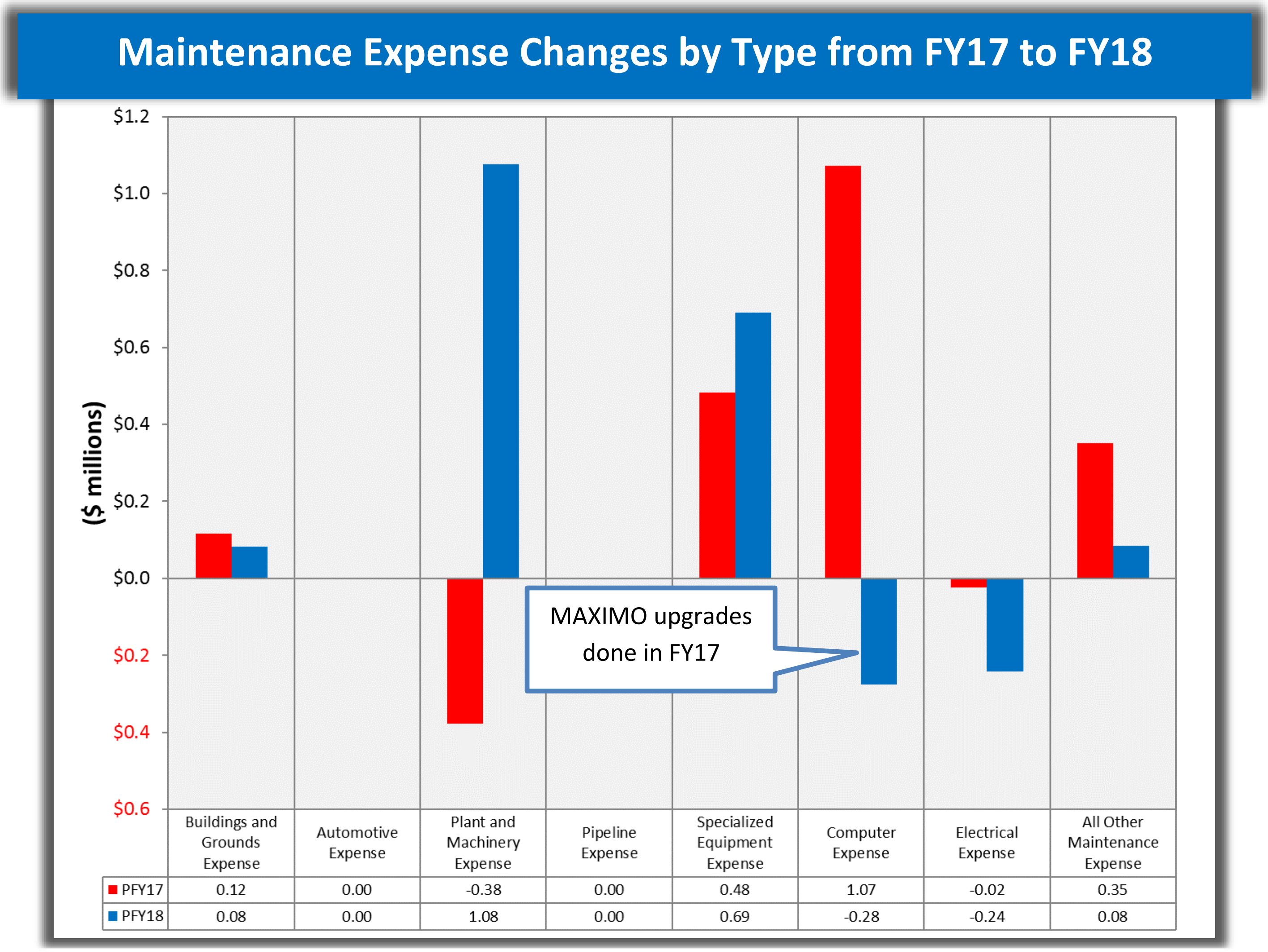


Figure 31

Other Services

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Pelletization	$13,120,003	$12,822,323	-$297,680	-2.3%
NEFCo contract to process and dispose of sludge pellets				
Lease	3,649,734	3,687,868	38,134	1.0%
Charlestown ($1.53 million + taxes and operating expenses), Chelsea ($1.89 million), Marlborough Records Center ($74.6 thousand).				
Telephone	1,984,455	2,000,822	16,367	0.8%
Voice and data lines				
Grit and Screenings Removal	1,220,312	1,163,014	-57,298	-4.7%
Removal of grit and screened materials from various facilities.				
All Others	3,000,351	3,159,079	158,728	5.3%
Printing, membership dues/subscriptions, advertising; health/safety, police details; Advisory Board operations; various other services.				
TOTAL OTHER SERVICES EXPENSES	**$22,974,855**	**$22,833,106**	**-$141,749**	**-0.6%**

Table 33

Other Highlights

- Sludge pelletization and grit and screenings expenses total $13.99 million or 61.3% of all Other S expenses
  - New England Fertilizer Company pelletizing operations costs are ba processing an average of 99.57 tons (based on a 3-year average), with annu updated by an inflation factor
- The pelletizing contract which ran from FY 2001 December 2015 has been extended and renegoti a five-year period which began January 2016
- Grit and screenings (and scum) are removed fro Island, the remote headworks, certain pump s and CSO facilities. Budget estimates assume 5,9 of material to be removed
- Lease costs include costs for the Chelsea p Charlestown lease and the Marlborough Records Center, and Warehouse (including revised rent schedules, operating expenses, and property taxes).

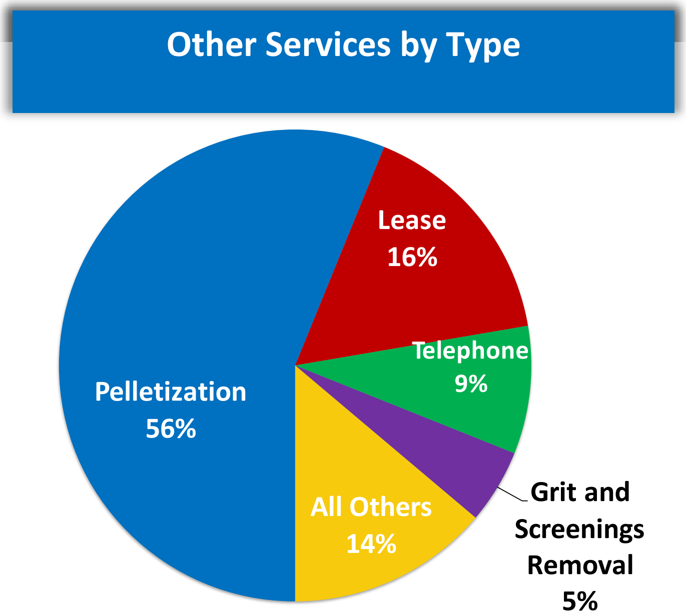


Figure 32

"DELTA REPORT" Other Services Decrease $142 Thousand

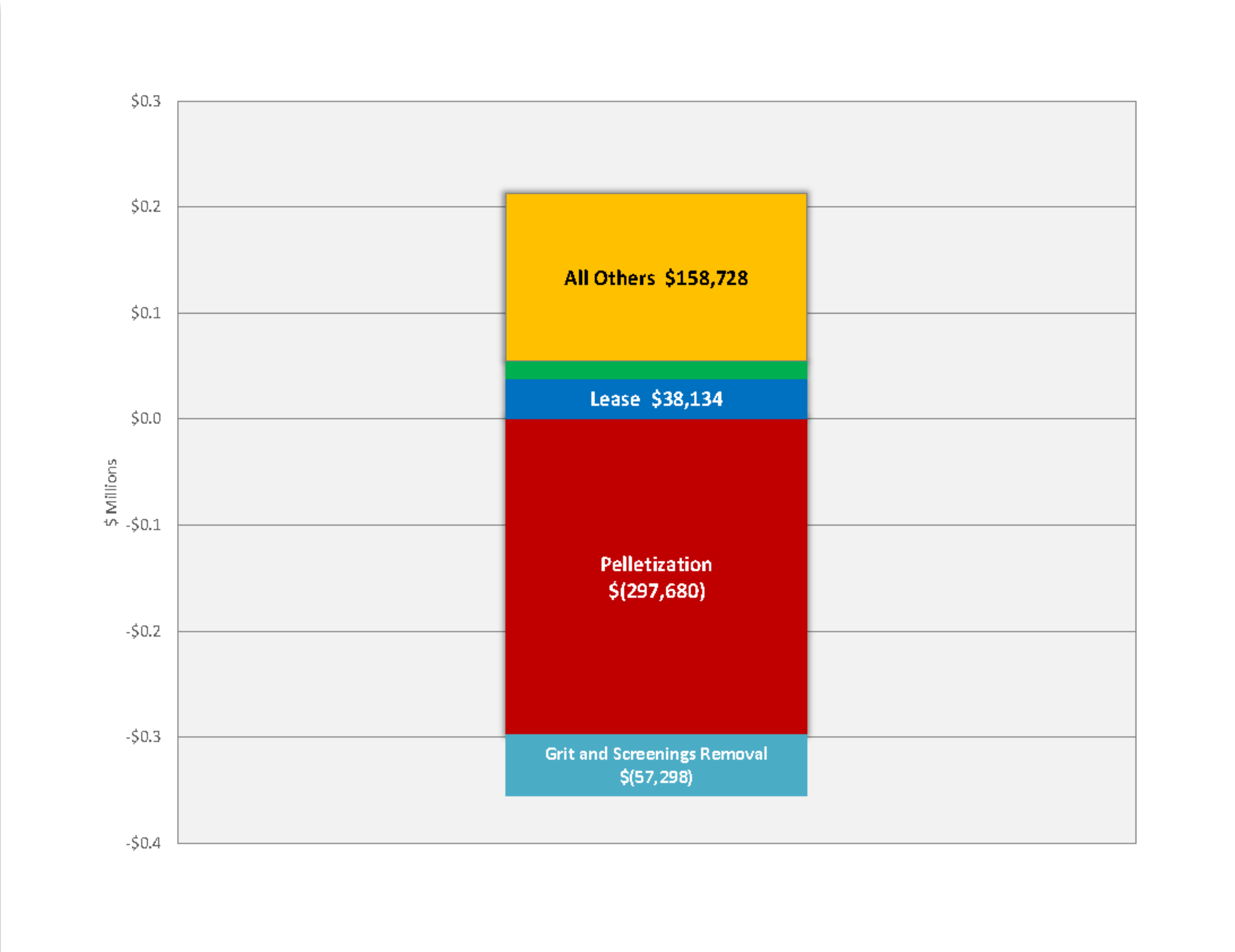


Figure 33

Sludge Pelletization

- FY18 proposed budget: $12.8 million
- Decrease from FY18: -$0.3 million (-2.3%)
- The budget average is based on a multi-year average of 99.57 tons and reflects the use of an eighth digester and thus reduced quantities on average from previous trends
- No co-digestion impacts on sludge quantities are assumed in the proposed FY18 CEB
- The inflation factor reflects assumptions for materials and labor, electricity, and natural gas and has declined for this proposed budget
- In March 2015, the Board of Directors, anticipating the December 31, 2015, end of the current NEFCo contract period, approved an amendment extending the contract term for five years, from January 1, 2016 through December 31, 2020. The Authority noted that the negotiated extension will result in a savings of an estimated $1.25 million over the five-year period, and will provide time for new pellet plant dryer technology to be proven, allow for the possible development of more firms to provide competition for a long-term bid, and clarify any uncertainty regarding potential changes in MWRA's sludge quantities.

Grit and Screenings

- Decrease from FY17: -$57 thousand (-4.7%)
- FY18 quantity estimate: 5,996 tons
- FY17 quantity estimate: 6,626 tons
- Based on actual quantities of previous years plus adjustments for modifications projects
- Decrease in quantity offset by projected 5% increase for price of next contract beginning June 2017.

Lease Costs

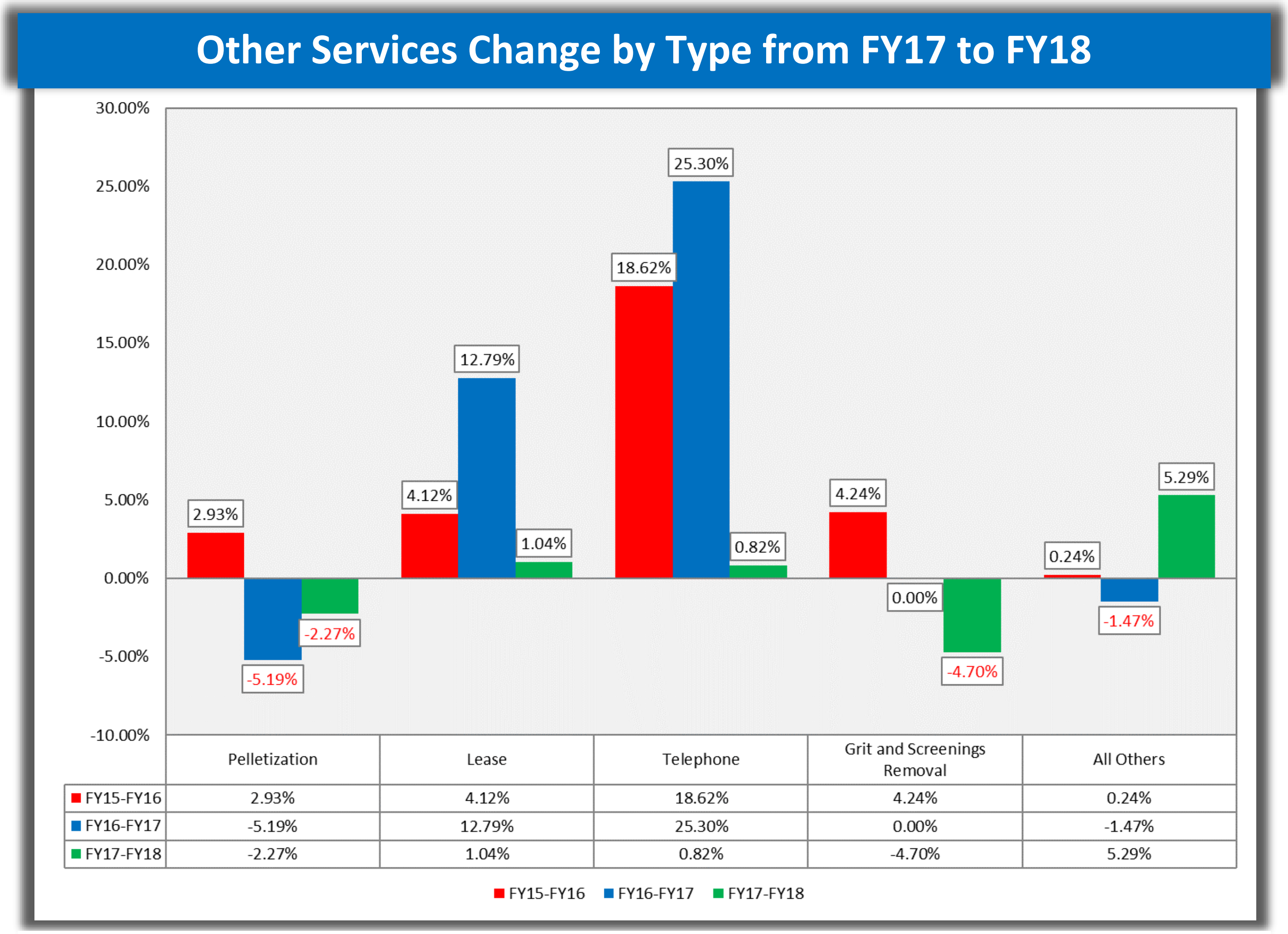
- Lease costs reflect increases in taxes and insurance charges for the Chelsea lease, and updated rent charges plus taxes and operating expenses for the Charlestown lease
- Rent, operating expenses, and tax-related costs are also included for the Records Center and Warehouse located in Marlborough
    - Charlestown: $1.53 million + taxes and operating expenses
    - Chelsea: $1.89 million
    - Marlborough Records Center: $74.6 thousand

Other Services

- Telephone expense increases 0.8% to $2.0 million
- Printing expense has increased 25.9% to $191 thousand
- Police detail expense increases 0.8% to $467 thousand
- Other services also include memberships, dues, and subscriptions; permit fees; and health and safety-related services

The Advisory Board expects the Authority will decrease the "other services" category of expense by $66,858.

The Advisory Board recommends that the Authority decrease the "other services" category of expense by an additional $1,722 consistent with the Advisory Board's final FY18 operating budget.



	Pelletization	Lease	Telephone	Grit and Screenings Removal	All Others
FY15-FY16	2.93%	4.12%	18.62%	4.24%	0.24%
FY16-FY17	-5.19%	12.79%	25.30%	0.00%	-1.47%
FY17-FY18	-2.27%	1.04%	0.82%	-4.70%	5.29%

Figure 34

Utilities

Line Item/Description	Final FY17	Proposed FY18	Δ ($s)	Δ (%)
Electricity	$16,145,658	$14,150,972	-$1,994,686	-12.4%
Most facilities are powered by Electricity including DITP and CWTP				
Diesel Fuel	2,557,235	8,711,363	6,154,128	240.7%
Heating, CTGs at DITP, and other backup generators				
Water	2,087,293	2,166,801	79,508	3.8%
A "pass-through" cost to account for Water; self-supplied				
Natural Gas	576,903	590,444	13,541	2.3%
Primarily used for heating various MWRA facilities				
All Other Utilities	173,989	130,628	-43,361	-24.9%
Oxygen, #2 Fuel Heating Oil, Propane, and all Other Utilities				
TOTAL UTILITIES EXPENSES	**$21,541,078**	**$25,750,208**	**$4,209,130**	**19.5%**

Table 34

Other Highlights

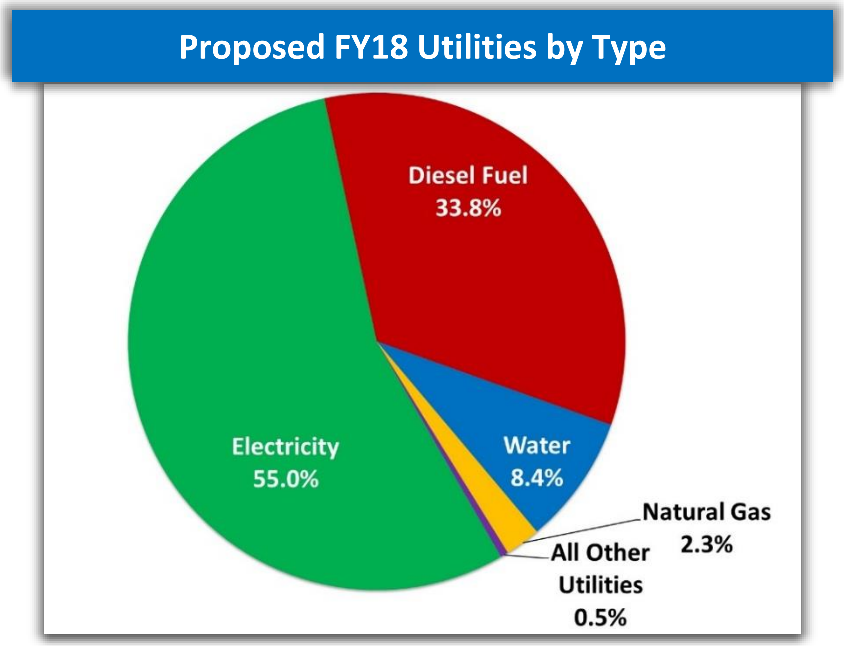


Figure 35

- Electricity expense continues decreases by due to reductions in purchased electricity relating to conservation projects (despite a slight 1% increase in assumed pricing)
- Increased wind and solar energy generation, hydropower generation, use of steam generators at Deer Island, and improved energy efficiency continue to reduce the amount of purchased electricity over the last several years
- Electricity prices in New England are driven by natural gas pricing rather than oil prices
- The increase of $13.5 thousand for natural gas due to increases for both price and quantities purchased
- Natural gas use at the Fore River pelletizing plant is part of the NEFCo monthly charge, under the Other Services budget category
- Diesel prices based off the initial estimates on the cross-harbor cable rehabilitation project. This proposal included the regular usage of combined-turbine generators at Deer Island

"DELTA REPORT" Utilities Spending Increase $4.2 Million

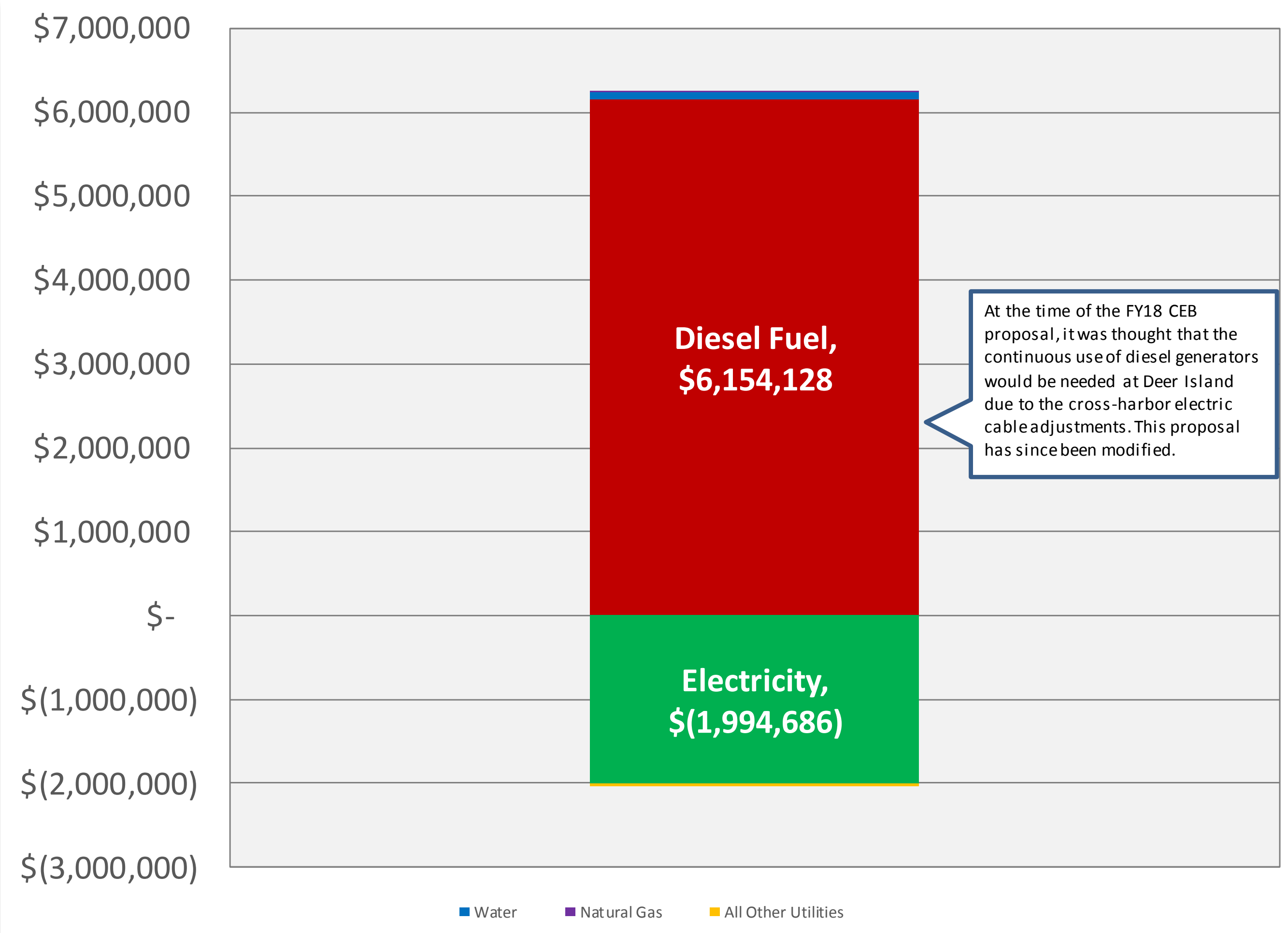


Figure 36

Electricity

- FY18 Deer Island electricity: $6.08 million
  - Decrease from FY17: $2.7 million
  - Driver: lower purchases due to anticipated diesel use increase
  - Deer Island electricity spending is 43% of all MWRA electricity purchases, this is lower than usual
- FY18 Deer Island electricity usage; 145 million kWh, based off of five year average
- Total self-generation of electricity at Deer Island increases with anticipated cross-harbor cable modifications.
  - Deer Island typically budgeted for 30% self-generated electricity
  - FY18 budgeted for self-generation of 52% of all electricity demand on the island
- Total purchased electricity at Deer Island based on three-year average

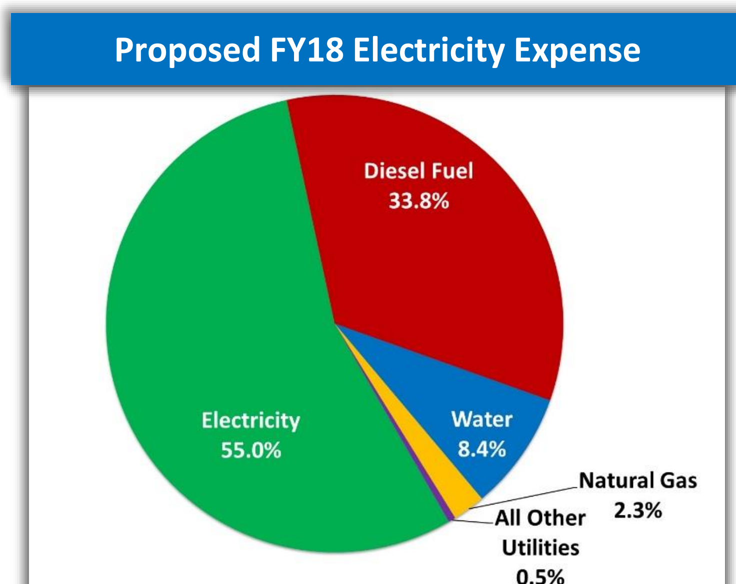


Figure 37

    - Decrease in FY18 due to 30.4 million kWh production from CTG generator use during cross-harbor cable work
    - Energy conservation and efficiency projects also continue to bring purchased electricity amounts down
- The Authority continues to pursue a number of demand-side changes and initiatives
- Field Operations Department (FOD) facilities electricity expense increases: $670 thousand (9.4%)

Diesel Fuel

- FY18 diesel fuel budget: $8.7 million
    - Increase of $6.2 million
    - Deer Island: $7.5 million
    - All other Wastewater Facilities: $1.2 million
    - Water facilities: $0.75 thousand
- Deer Island usage increased with initial cross harbor cable protection project
    - See Policy Chapter, page 104, for a further discussion on the cross-harbor protection project
- Field Operations Department usage level

Natural Gas

- FY18 natural gas expense: $590.4 thousand
    - Increase from FY17: $13.5 thousand
- Natural gas is used at a number of facilities in the Field Operations Department

Being made aware of pricing and usage trends, and with the cross-harbor cable plan modified, the Advisory Board expects the Authority to decrease its FY18 CEB "utilities" expenses by an estimated $4,008,480.

Chemicals

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Soda Ash Used primarily at the CWTP; some at Clinton WWTP	$3,439,249	$3,577,299	$138,050	4.0%
Sodium Hypochlorite Used for treatment at DITP ($1.0 million) and CWTP ($0.9 million)	2,077,435	2,694,082	616,647	29.7%
Ferric/Ferrous Chloride For struvite control at DITP.	804,986	913,641	108,655	13.5%
Liquid Oxygen Ozone generation at CWTP	442,781	449,981	7,200	1.6%
Sodium Bisulfite For dechlorination of treated wastewater and water	228,671	541,379	312,708	136.8%
Hydrofluosilic Acid Fluoride control at CWTP	380,362	360,943	-19,419	-5.1%
Polymer Sludge thickening at DITP and Clinton	279,496	316,615	37,119	13.3%
Activated Carbon For odor control at DITP	318,000	328,335	10,335	3.3%
Carbon Dioxide To increase pH and alkalinity level of water supply at CWTP	314,275	314,784	509	0.2%
All Other Chemicals For algae control; corrosion control in Framingham Relief Sewer and DITP	825,152	917,730	92,578	11.2%
TOTAL CHEMICALS EXPENSES	**$9,110,407**	**$10,414,789**	**$1,304,382**	**14.3%**

Table 35

Other Highlights

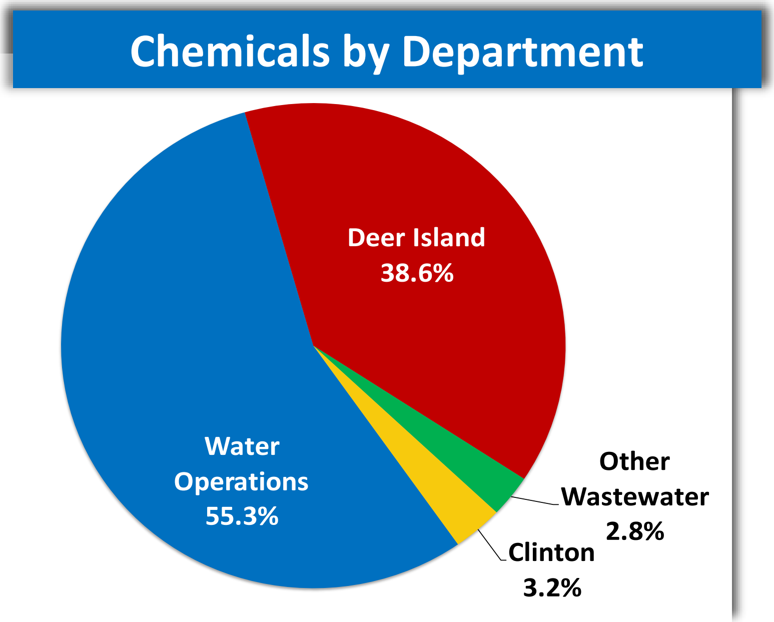


Figure 38

- Chemicals budget totals $10.4 million or 4.
  all direct expenses
- Water operations chemicals: $5.8 million
  - Increase: $0.17 million (3%)
  - Assumes third year of impact of fluoride regulations at CWTP
- DITP chemicals: $4.0 million
  - Increase of $1.1 million (36%)
  - Assumes 6 months of new N
    permit for FY18
- Clinton wastewater treatment plant chen
  $0.34 million
  - Increase of $8.6 thousand (2.6%)
  - New NPDES permit went into eff
    March 2017
  - Chemical expense has doubled since FY 2010, particularly for soda ash
- Other wastewater facilities chemicals: $0.29 million

"Delta Report" Chemicals Spending Increases $1.3 Million

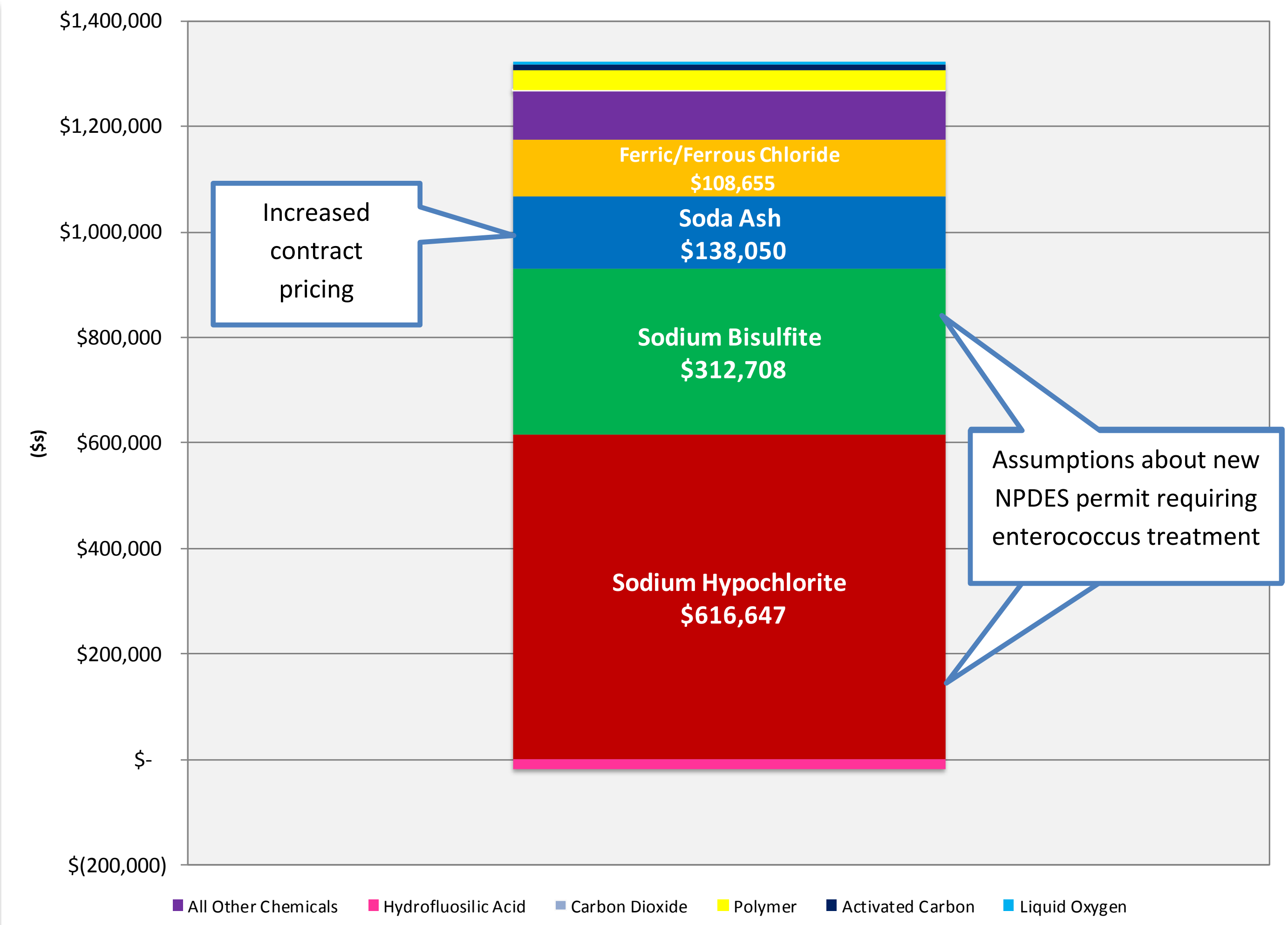


Figure 39

Regulatory Changes Impacts

- Assumes new DITP NPDES permit will be in effect starting December 2017 or January 2018
  - Results in increased sodium hypochlorite and sodium bisulfite budgets of $600 thousand
- Costs of using increased amounts of ferric chloride to control phosphorus levels at Clinton are budgeted at $41 thousand, twice the costs incurred 5 years earlier
  - A switch to ferrous chloride may be necessary due to availability issues
- Chemicals expense represents 16% of the Clinton budget, a 3% decrease from FY17
- Assumes fluoride regulations will be in effect during FY18
  - Fluoride expense declines to $361 thousand, a 5% decrease from FY17, and less than half the $763 thousand of 6 years earlier

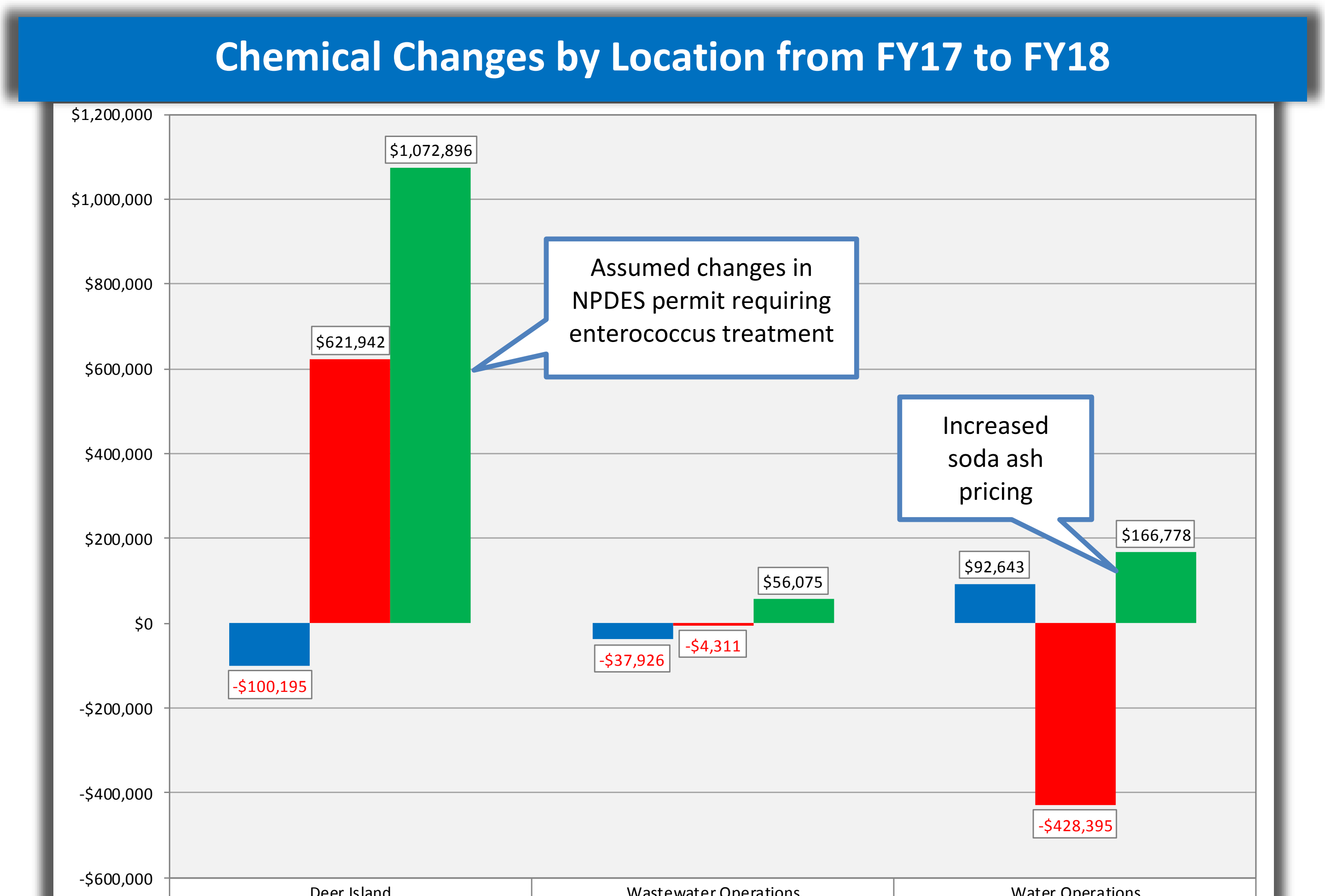
Chemicals Changes by Location

- Deer Island increases due to assumption of six months of a new NPDES permit
    - A new NPDES permit is expected to include additional chemical treatment of enterococcus at a cost of up to $1.3 million per year
    - FY18 includes $600 thousand for the assumed six months

The Advisory Board recommends removing treatment of enterococcus from the FY18 budget and reducing the FY18 chemicals budget by $600,000.

- See the Policy Chapter, page 101 for an in-depth discussion of the Advisory Board's enterococcus recommendation
- Water operations chemicals spending increases by $167 thousand due primarily to increases in pricing of soda ash and sodium hypochlorite
- Nearly 60% (or $6.27 million) of all chemicals spending is for soda ash and sodium hypochlorite

The Advisory Board expects that the MWRA will increase the "chemicals" category of expense by $3,203 to reflect updated pricing and usage assumptions.



	Deer Island	Wastewater Operations	Water Operations
PFY16	-$100,195	-$37,926	$92,643
PFY17	$621,942	-$4,311	-$428,395
PFY18	$1,072,896	$56,075	$166,778

Figure 40

Professional Services

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Lab and Testing Analysis	$1,582,943	$1,692,768	$109,825	6.9%
Primarily harbor and outfall monitoring; some specialized outside lab services				
Security	1,840,000	1,848,000	8,000	0.43%
Security and guard contracts				
Engineering	801,619	719,376	-82,243	-10.3%
Specialized outside services such as dam inspection and dam safety services; as needed engineering support				
All Other Professional Services	2,307,377	2,425,571	118,194	5.1%
Legal Services, Audit Services, Local Limits Study, communications, energy audits				
TOTAL PROFESSIONAL SERVICES EXPENSES	**$6,531,939**	**$6,685,715**	**$153,776**	**2.4%**

Table 36

Other Highlights

- Security services costs reflect contract costs for the Chelsea, Deer Island, Carroll Water Treatment Plant facilities, and the Charlestown offices
- All other professional services include:
  - Trustee, financial advisor, and rela services for the Treasury Department
  - Insurance consultant services
  - Audit services
  - Legal services
  - Energy consulting services
  - Technical and professional developm services for the Human Resou Department plus services relating to employee assistance program and t party claims administration services for workers' compensation program
  - MIS services relating to the upgrade of MAXIMO system
  - Communications services, including funding for WAC and WSCAC
  - Other engineering services includes funding for a comprehensive survey in all the reservoirs for invasive plants

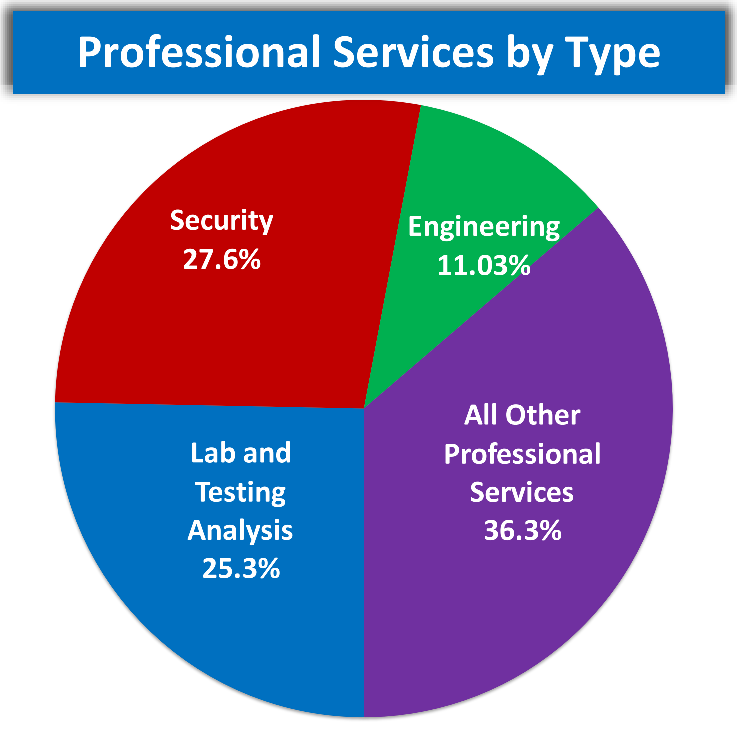


Figure 41

"Delta Report" Professional Services Expense Increases $153 Thousand

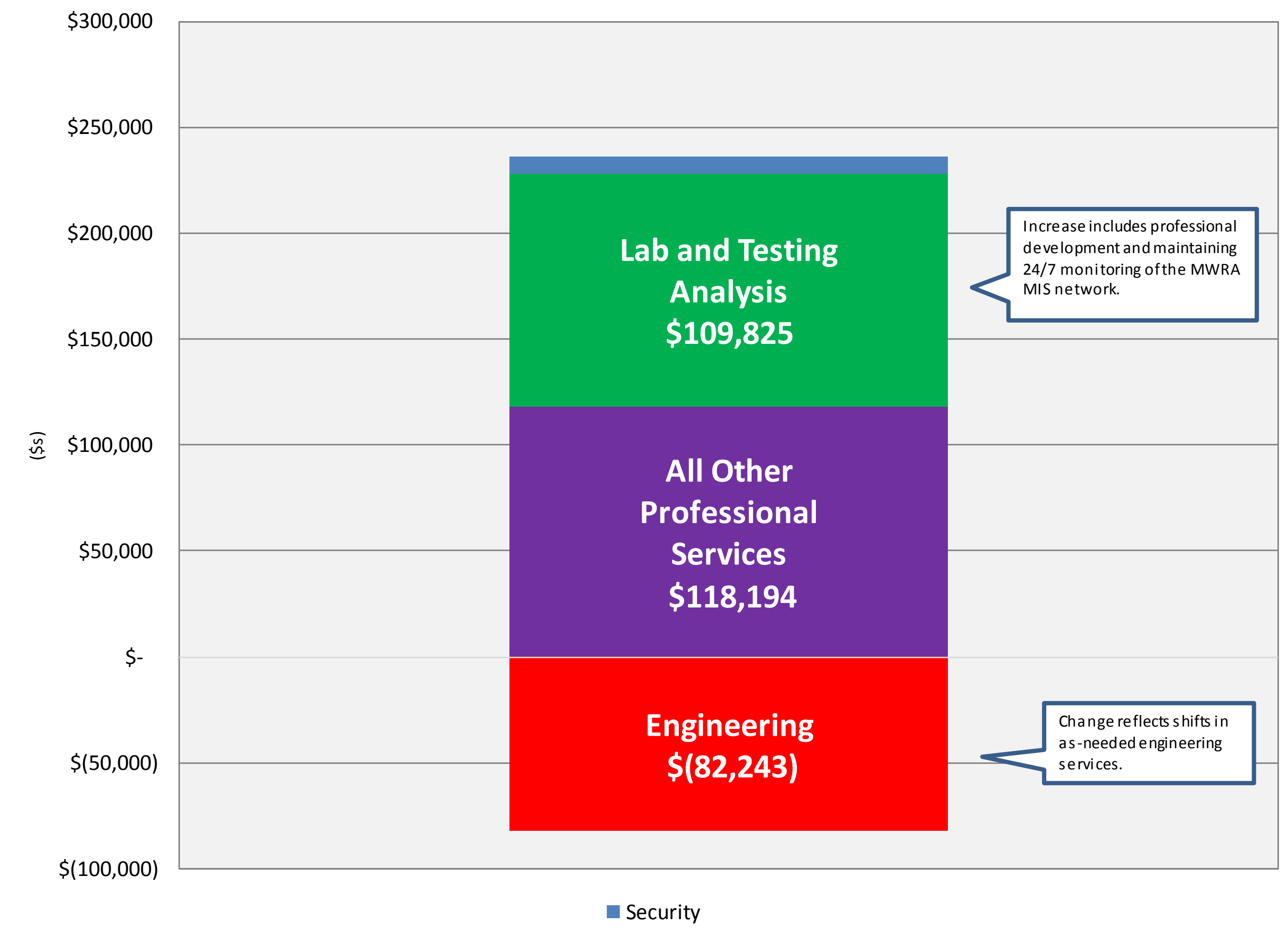


Figure 42

Laboratory, Testing, and Analysis Services

- FY18 harbor and outfall monitoring support: $1.41 million for water column and water quality modeling and monitoring in the harbor and Massachusetts Bay; the proposed budget is based on a three-year average
- Largest area of expense within laboratory testing category
- Monitoring costs linked to existing National Pollutant Discharge Elimination System (NPDES) permit
- Current permit expired in August 2005
- New permit actively being drafted but not yet released for review. Proposed FY18 CEB assumes new permit will be in place for six months of the fiscal year
- FY18 expense is 6.9% higher than FY17. Increases include:
  - Laboratory and testing analysis services contracted for the UCMR4 water quality project

Other Engineering Services Expenses

- Budgeted $105 thousand for as-needed engineering services at Deer Island and $40 thousand for engineering services at Clinton

Security Services

- Budgeted at $1.85 million, essentially the same level as budgeted in FY17
- Includes funding for security and related services for the Deer Island Treatment Plant, Carroll Water Treatment Plant and the Charlestown Navy Yard offices for the second year of the contract

All Other Professional Services

- $400 thousand for professional assistance with network infrastructure, applications and design for the MIS Department
- $358 thousand for Professional Development and Technical Training through Human Resources
- $176.3 thousand in support of the WAC and WSCAC advisory committees
- $110 thousand for updating Dam EAPs to match FEMA regulatory changes
- $165 thousand for legal services related to workers' compensation claims administration services
- $60 thousand for contribution for modeling work coordinated through the Mystic River Watershed Association, pending further discussions
- $66 thousand for survey of new invasive aquatic plants plus $75 thousand for monitoring mechanical harvesting of aquatic invasive plants in the reservoirs
- $10 thousand for detailed energy audits

The Advisory Board expects the MWRA to request an increase of the "professional services" category of expense by $435,907 in its final budget.

Policy Point

Co-Permittees

"Never, Ever, Ever!"

It may seem unusual to see a discussion of the issue of naming member communities as co-permittees to the Deer Island NPDES permit in the Professional Services chapter; however, there have recently been some experiences that have reinforced the Advisory Board's concerns.

The Advisory Board has long maintained that the co-permittees language could be used by EPA to either force the MWRA to become environmental regulators of its member communities, or to force the MWRA to perform stormwater work if member communities are out of compliance. The Advisory Board very strongly believes that the relationship between the MWRA and the communities should not be that of regulator and permittee. Additionally, the Advisory Board has also consistently maintained the position that the MWRA is not in the stormwater business. We have supported and will continue to support our communities as they face the upcoming challenges of the fully implemented MS4 permits, but stop short at suggesting that MWRA should fund or perform this work for the communities.

The Advisory Board had some success with the Clinton Treatment Plant's NPDES permit by including language that clarified the responsibilities of the MWRA versus the co-permittee communities, and expected this approach to be used in the next permit.

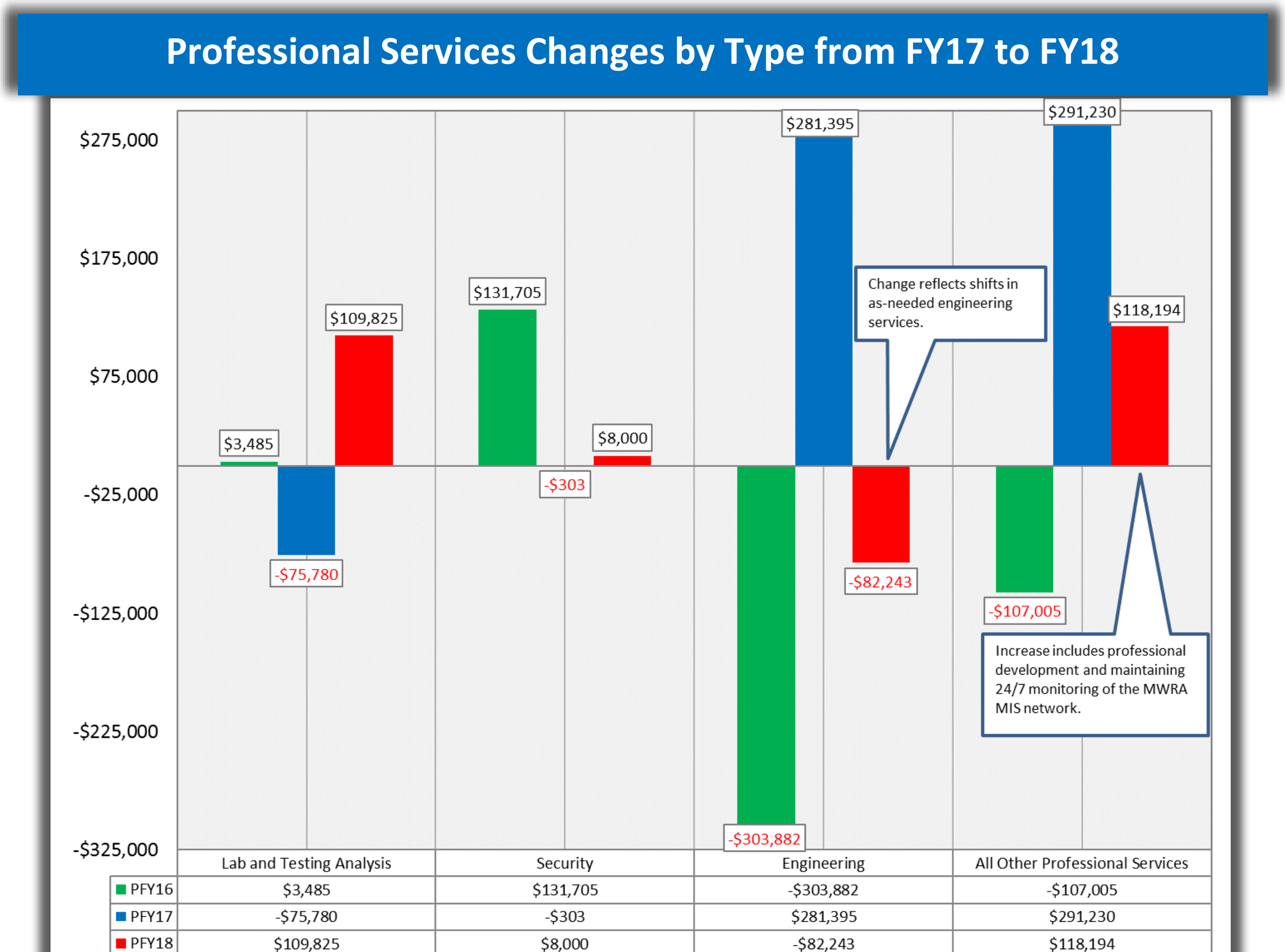
However, an unrelated issue brought to the fore the liability, challenges, and costs that having co-permittee language could cause, namely the cross-harbor cable (see Policy Chapter, page 104, for a full discussion of the cross-harbor cable and recommendations). After many years of discussions about the permit and ways to perform a planned dredging project without harming the cable, the Army Corps of Engineers commenced a lawsuit against NSTAR and HEEC ("Eversource") and MWRA.

If Eversource owns the cable, why was MWRA named in the suit? Because it is listed as a co-permittee on the Army Corps permit for the submerged cable though MWRA does not own the cable, did not install the cable, and was not aware that the cable's depth was not in compliance with the permit. This use of co-permittee language has provided recent and real experience with the effects it can have upon the MWRA.

As such, the Advisory Board is even more strident in its position on this issue and instead recommends that MWRA insist that the final Deer Island permit does not contain any language naming member communities as co-permittees.

The Advisory Board also recognizes that EPA will likely not agree to this provision and instead issue the final permit with its desired co-permittee language.

That is why the Advisory Board further recommends that the MWRA increase its legal services line item by $750,000 to fund any outside counsel required to challenge the final Deer Island NPDES permit to remove co-permittee language.



	Lab and Testing Analysis	Security	Engineering	All Other Professional Services
PFY16	$3,485	$131,705	-$303,882	-$107,005
PFY17	-$75,780	-$303	$281,395	$291,230
PFY18	$109,825	$8,000	-$82,243	$118,194

Figure 43

Other Materials

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Vehicle Purchase/Replacements	$1,900,000	$1,900,000	$0	0.0%
Purchases of vehicles and equipment under $100,000.				
Vehicle Expense	893,320	771,017	-122,303	-13.7%
Bulk gasoline, diesel purchases, mileage reimbursement, and some toll fees.				
Lab and Testing Supplies	879,809	908,309	28,500	3.2%
Supports Central Lab and TRAC.				
Equipment/Furniture	409,583	599,403	189,820	46.3%
Miscellaneous equipment and furniture.				
Computer Hardware & Software	610,981	906,742	295,761	48.4%
PCs, printers, plotters, and scanners.				
Office Supplies	250,177	251,959	1,782	0.7%
Office supplies including paper.				
All Others	1,275,760	1,359,860	84,100	6.6%
Includes postage, work clothes, and health and safety materials.				
TOTAL OTHER MATERIALS EXPENSES	**$6,219,630**	**$6,697,290**	**$477,660**	**7.7%**

Table 37

Other Highlights

- Funding for vehicle replacement supports purchase of 54-63 vehicles or 11-12% of the active fleet
- FY18 begins a large-scale PC replacement plan for 1,250 computers agency-wide
- Vehicle expense, lab and testing supplies, and work clothes budgets are based on updated historical spending

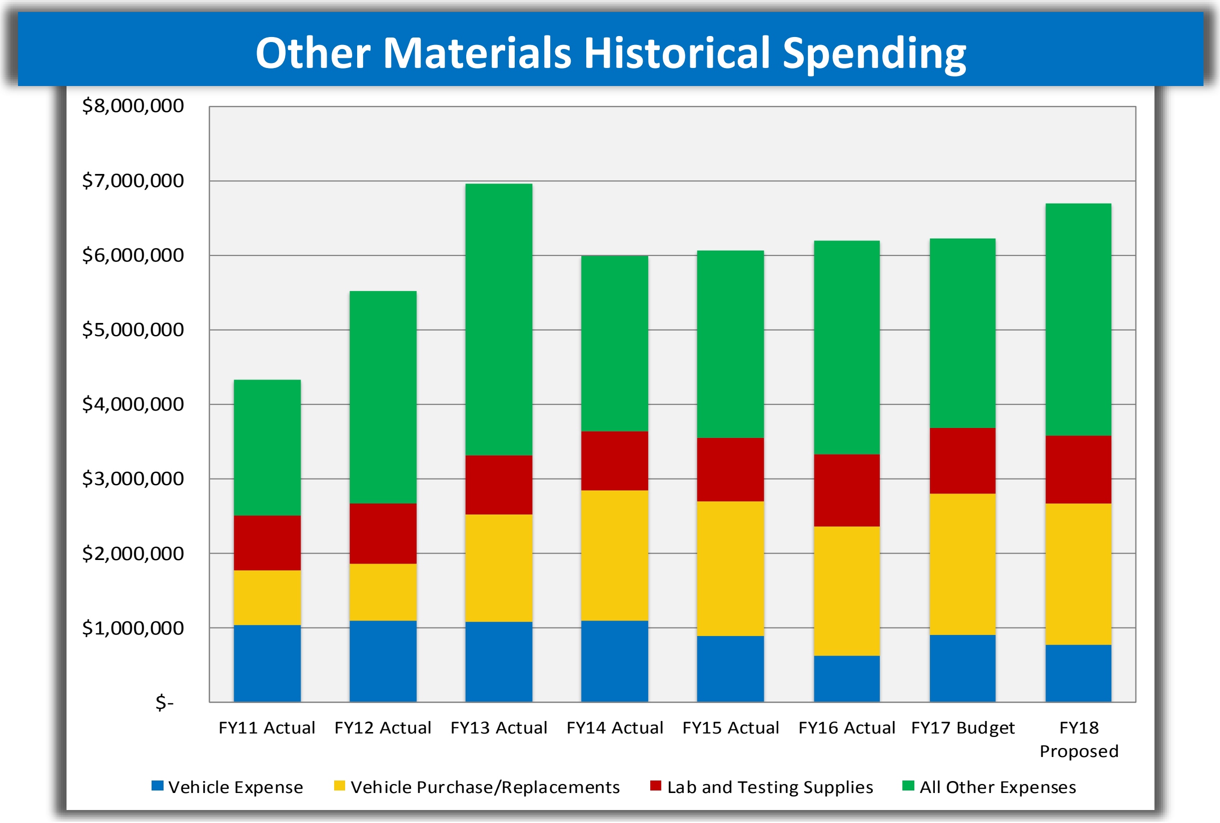


Figure 44

"Delta Report" Other Materials Spending Increases $478 Thousand

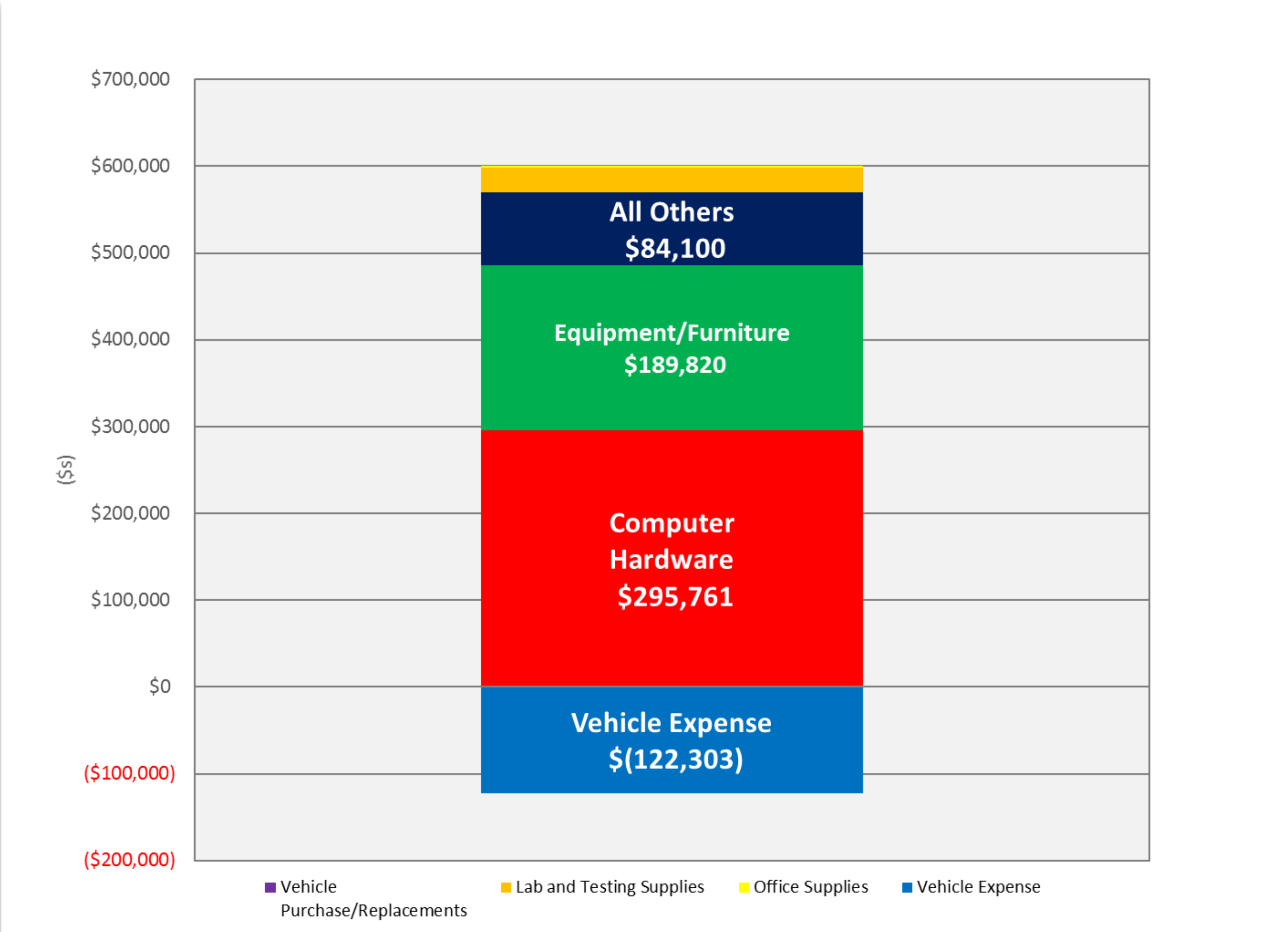


Figure 45

Computer Hardware and Software Purchases

- The computer hardware budget increases by $295.8 thousand (48.4%)
  - Increase largely driven by plan to replace 1,250 of the Authority's PCs as part of five-year replacement cycle
- Findings of the five-year Information Technology (IT) strategic plan (completed in 2012) include the need to:
  - Adopt more effective and standardized IT management and processes
  - Develop methods to share data quickly across multiple applications
  - Develop streamlined work flows
  - Reduce reliance on paper records and improve access to information
- Because technology evolves so rapidly, the Authority will have to continuously adapt its plans to accommodate changes and updates to its programs and software

Vehicle Purchases

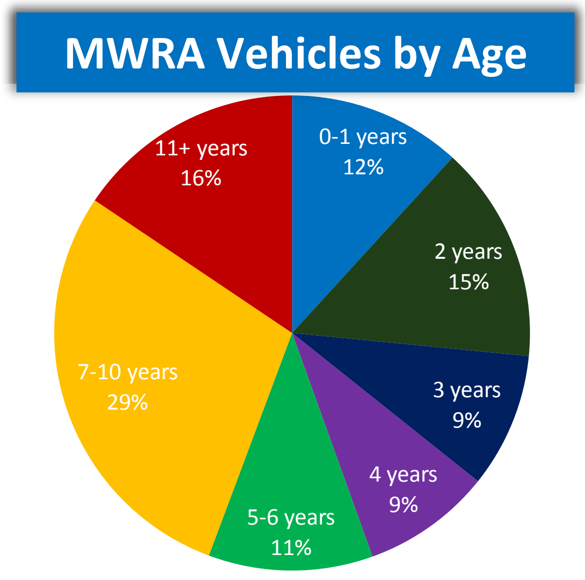


Figure 46

- Vehicle purchases is level-funded at $1.9 million
- Vehicle fleet size is reviewed regularly, but will be undergoing comprehensive fleet-wide analysis within the next year
- 2003 was the last time a comprehensive fleet-wide analysis w performed

The Advisory Board supports a comprehensive review of tl MWRA's fleet as a good practice periodically.

Vehicle Expense

- Vehicle expense declines $122 thousand (13.7%) largely due lower fuel pricing assumptions
- The Authority continues to reduce fuel consumption by reducing idle times and increasing the number of vehicles powered by fuel other than gasoline and diesel. The Authority procures bulk fuels from state contracts
- The Authority has instituted an Automated Vehicle Locator (AVL) program, which has also resulted in reduced fuel consumptio
- Over 15% of the fleet is powered by fuels other than gaso and diesel (See Figure 47)
- The Authority has also reduced the number of domiciled vehi and increased the use of pooled vehicles, increasing the us life of the vehicles
- Beginning in FY18, the Authority is centralizing MassI transponder costs in the Fleet Services Department
- Vehicles at the end of their useful lives for the agency are sol surplus, resulting in increased income

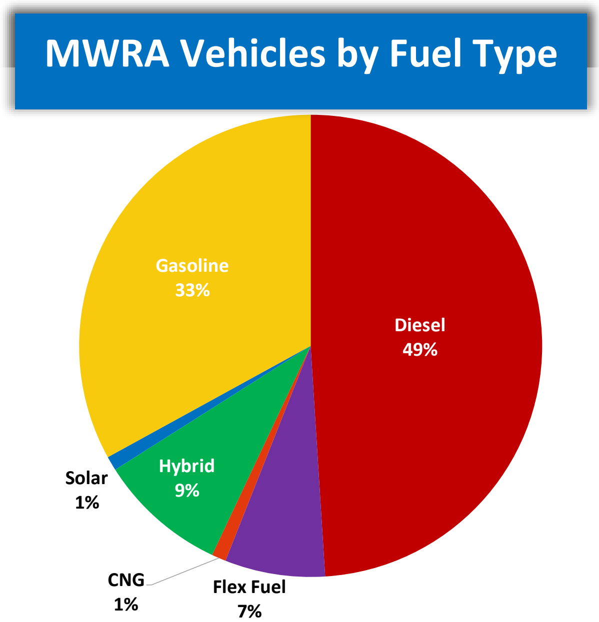


Figure 47

Equipment/Furniture

- Equipment/furniture increases by almost $190 thousand (46.
    - Increase driven by $140 thousand for Contamir... Monitoring System specialized equipment for Water Quality Assurance
    - Most of the remaining increase due to replacing old office furniture

The Advisory Board expects the Authority to decrease the "other materials" category of expense by $4,631.

Training and Meetings

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Training and Meetings	$435,481	$406,181	-$29,300	-6.7%
TOTAL TRAINING AND MEETINGS EXPENSES	**$435,481**	**$406,181**	**-$29,300**	**-6.7%**

Table 38

Other Highlights

- Costs cover a variety of meetings, seminars, conferences, and training sessions. Most spending supports maintaining professional licenses and certifications, as well as training in the use of specialized equipment, out-of-state site visits (such as water treatment plants that use UV disinfection) and site audits, and health and safety compliance, as well as cyber security training
- Decrease from FY17: -$29 thousand (6.7%)
- Despite decrease, funding level remains consistent with the past few years, when an organization-wide strategy to prepare employees for internal promotions as the impact of retirements is realized
- The Authority also budgets nearly $358 thousand for professional development and technical training under professional services in the Human Resources Department.

The Advisory Board expects the Authority to increase the "training and meetings" category of expense by $88.

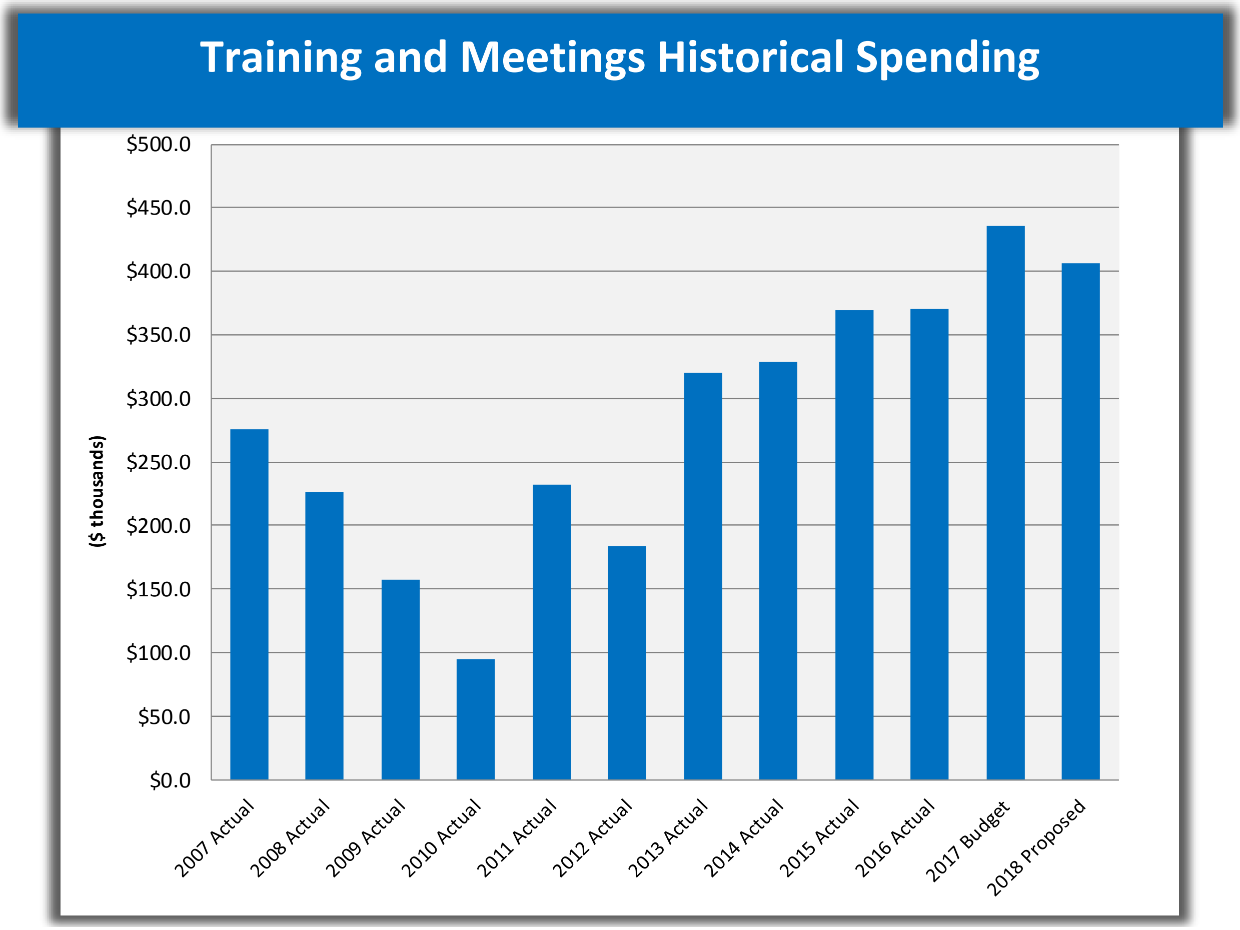


Figure 48

Revenue

Line Item/Description	*Final FY17*	*Proposed FY18*	*Δ ($s)*	*Δ (%)*
Rate Revenue	$694,878,500	$721,238,000	$26,359,500	3.8%
Revenue generated directly from member communities through annual assessments.				
Other User Charges	8,752,834	8,964,366	211,532	2.4%
From 20 customers including CVA communities; emergency water supply connections, and entrance fees.				
Other Revenue	6,319,171	7,658,774	1,339,603	21.2%
Rate Stabilization	0	0	0	-
From rate stabilization fund.				
Investment Income	9,473,490	11,254,782	1,781,292	18.8%
Interest on both short- and long-term investments.				
TOTAL REVENUES	**$719,423,995**	**$749,115,922**	**$29,691,927**	**4.1%**

Table 39

Other Highlights

- Proposed FY18 rate revenue increase: +$26.4 million (3.8%)
- Non-rate revenue increase: +$3.3 million
- Other user charges decrease for CVA communities for the first time in three years
- Other revenue from forestry product sales, fishing, and hunting licenses is credited to the Office of Watershed Management budget. (See Indirect Expenses, Watershed Revenues,

- Table 31)

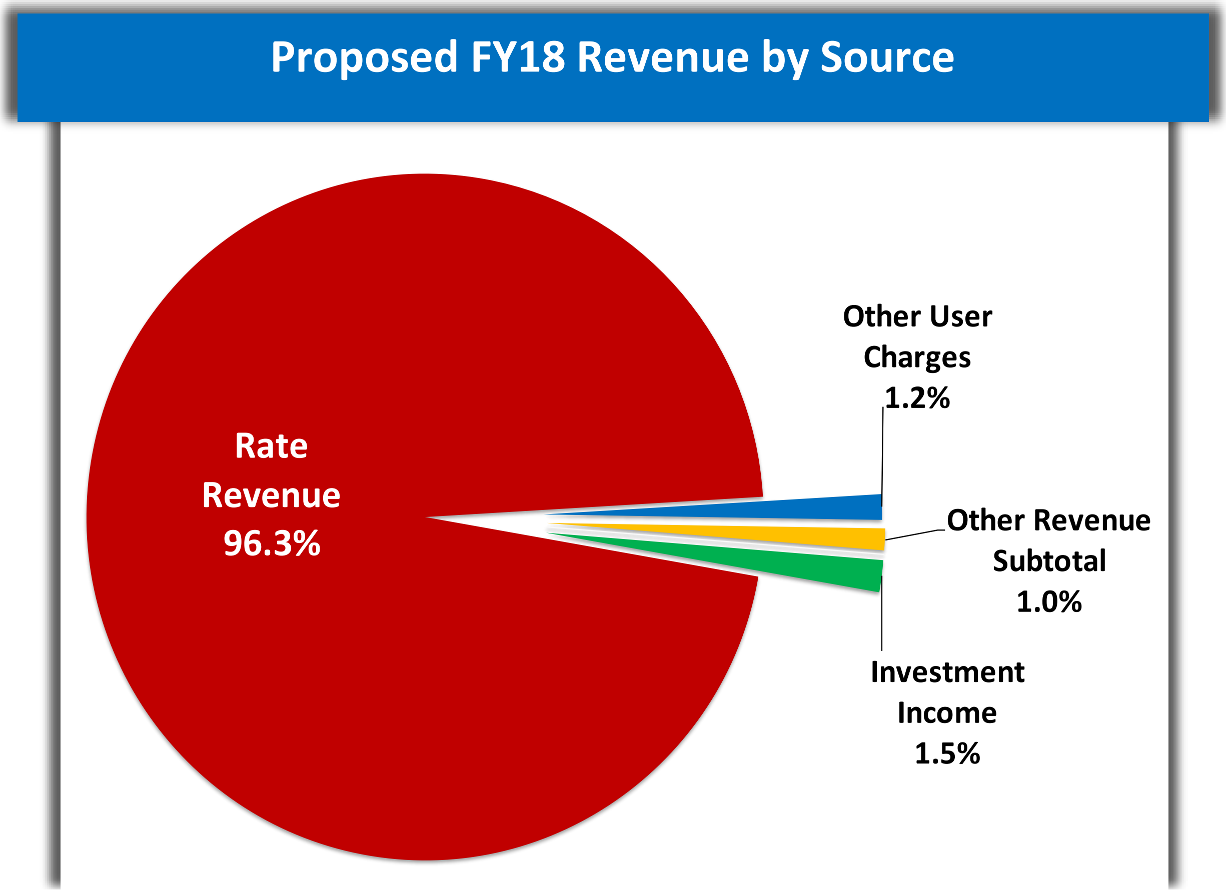


Figure 49

"Delta Report" Revenue Increases $29.7 Million

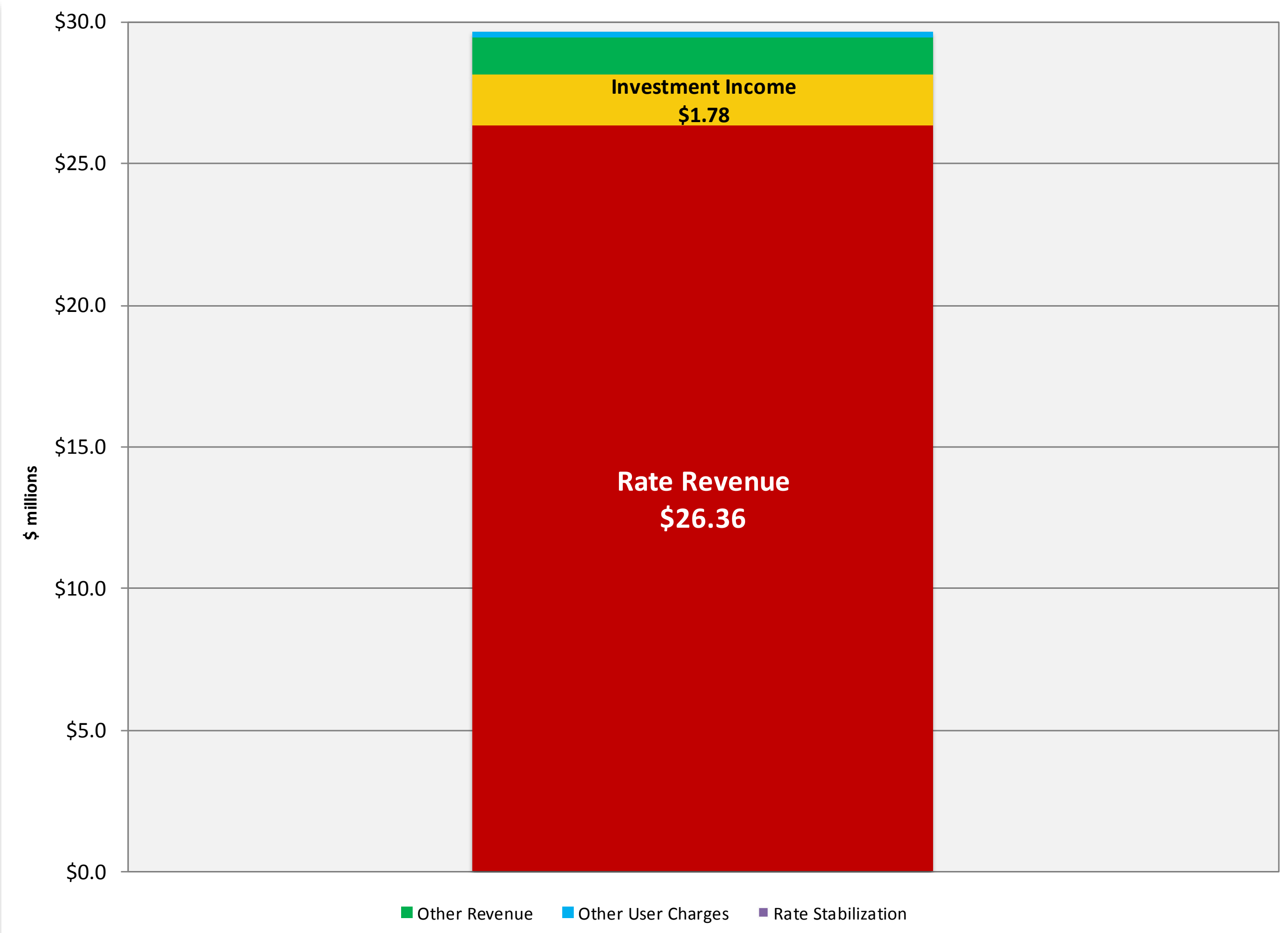


Figure 50

Non-Rate Revenue

- FY18 proposed non-rate revenue: $27.88 million
  - Increase from FY17: +$3.3 million
- Other Revenue increase: +$1.3 million (21.2%)
  - Majority of increase ($1.1 million) due to increase in load response program
  - Energy-related Revenue: $4.5 million (see Table 41)

Table 40

Other User Charges		
User	**Charge**	**Notes**
Fernald School	$0	
Commonwealth Zoological (State Zoo)	41,141	
Department of Youth Services	39,263	
DCR Pools/Parks	27,427	
Regis College	69,548	Individual users of sewer system
NE Center for Children	23,275	
Lancaster	407,167	
Worcester	164,418	Income relating to Clinton Wastewater Treatment Plant costs
Clinton	500,000	
Chicopee	3,400,877	
Wilbraham	792,011	CVA Communities
South Hadley	721,344	
WTP Residuals	400,712	From nine water treatment plants
Entrance Fees	726,500	Stoughton, Wilmington & Dedham-Westwood
Deer Island	1,650,683	Transfer payment of sewer cost to water revenue
TOTAL	**$8,964,365**	

Table 41

Other Revenue			
Category	**Budget FY17**	**Proposed FY18**	**Description**
Hydropower Revenue	$216,876	$209,255	Energy-related revenue
Wind Turbines Revenue	396,594	373,153	
Solar Power Revenue	88,303	94,803	
Renewable Portfolio Credits	1,246,236	1,271,033	
Load Reduction & Forward Capacity	1,218,739	2,424,703	
Utility Rebates for Equipment	200,000	100,000	
Permit Fees	2,060,000	2,100,000	TRAC permit and monitoring fees.
Penalties	100,000	100,000	Issued through the TRAC program.
Payments from Commonwealth	0	0	For chemical costs via statute.
Miscellaneous Revenue	992,423	985,827	Includes revenue from Fore River Railroad, antenna licenses, and other miscellaneous revenues.
TOTAL	**$6,519,171**	**$7,658,774**	

The Advisory Board expects the MWRA to reduce the "other revenue" category of revenue by $299,696 to reflect updated assumptions.

Policy Point — TRAC Permit Fees

"Good for the Goose, Good for the Gander"

One source of MWRA non-rate revenue includes permit fees and penalties that are part of the Toxic Reduction and Control (TRAC) Program, which monitors and regulates the wastewater discharges of some industrial users within the MWRA sewer service area. The goal and aim is to ensure that wastewater entering MWRA's system meets all requirements, and to assess penalties when they are not. Many years ago, the MWRA decided that the program's permit fees would not be sized for complete cost-recovery of the program. When reviewing and modifying permit fees periodically over the years, increases remained consistent with the partial cost-recovery approach. MWRA last approved increases in FY10, implementing a three-year plan for incremental increases ending in FY12. MWRA had discussed permit fee levels internally a few years ago, but due to economic conditions decided to forego increases at that time. It has been five years since permit fees were increased, and the Advisory Board believes it is time to review the issue.

In FY12, revenue from permit fees totaled 53.4% of the TRAC program's total costs; yet, by FY16 this amount dropped to 42.4% of total costs.[16] One could argue that TRAC penalties are also a source of non-rate revenue and further cover the cost of the program; however, since the program's goal is compliance the ideal outcome would be a year with no penalties. For this reason, the Advisory Board believes cost-recovery calculations should focus on only permit fee revenues.

The Advisory Board has no desire to resize permit fees for full cost-recovery at this time, but does feel that regular increases are necessary. After all, the MWRA's rates mantra is "sustainable and predictable" and the Advisory Board advocates for its member communities to increase its water and sewer retail rates each year as the fiscally responsible approach for addressing increasing local water and sewer costs. Don't these permit fees also deserve a similar approach?

One issue to consider is that the process to update permit fees is lengthy and time consuming, requiring notice to permittees and accepting feedback. To undertake this same process each year is arguably not the best use of MWRA staff time. This is what led to the most recent approach to fee increases, where a three-year incremental increase was approved between FY10 – FY12. A multi-year approval was definitely more efficient approach than an annual review; however, the Advisory Board would like to advocate for an annual formula to increases that would make them, in essence, automatic.

Many organizations base automatic increases on charges and fees on indices such as inflation or another benchmark index relevant to the charge being levied. In TRAC, personnel expenses make up 97% of the program's total costs.[17] Given this, linking automatic permit fee increases to increases in personnel costs might make the most sense.

The Advisory Board recommends that the MWRA staff work with Advisory Board staff to determine the best "target" level for cost-recovery of the TRAC program. Additionally, the Advisory Board recommends identifying and implementing an automatic escalator to make fee increases sustainable and predictable for the permittees.

Investment Income

- FY15 and FY17 are the only years that investment income were below $10 million since before FY90 when the Authority first issued its own debt. Theses historically low levels were due to:
- Assumed short-term interest rates of 0.20%
- Lower average balances in both short-term and long-term investments

[16] Both calculations include labor overhead costs.
[17] Personnel costs include wages and salaries, overtime, and fringe benefits.

- Lower average fund balances in the construction fund
- FY18 proposed investment income: $11.3 million
- Increase from FY17: +$1.8 million (+18.8%)
- Due to recent increases in short-term interest rates, the Authority has increased its short-term interest rate assumptions from 0.6% to 1.25%
    - This short-term increase adds $2.6 million in revenue
- While the Advisory Board acknowledges that interest rates are increasing and supports increasing this assumption, we would prefer a less aggressive assumption for FY18

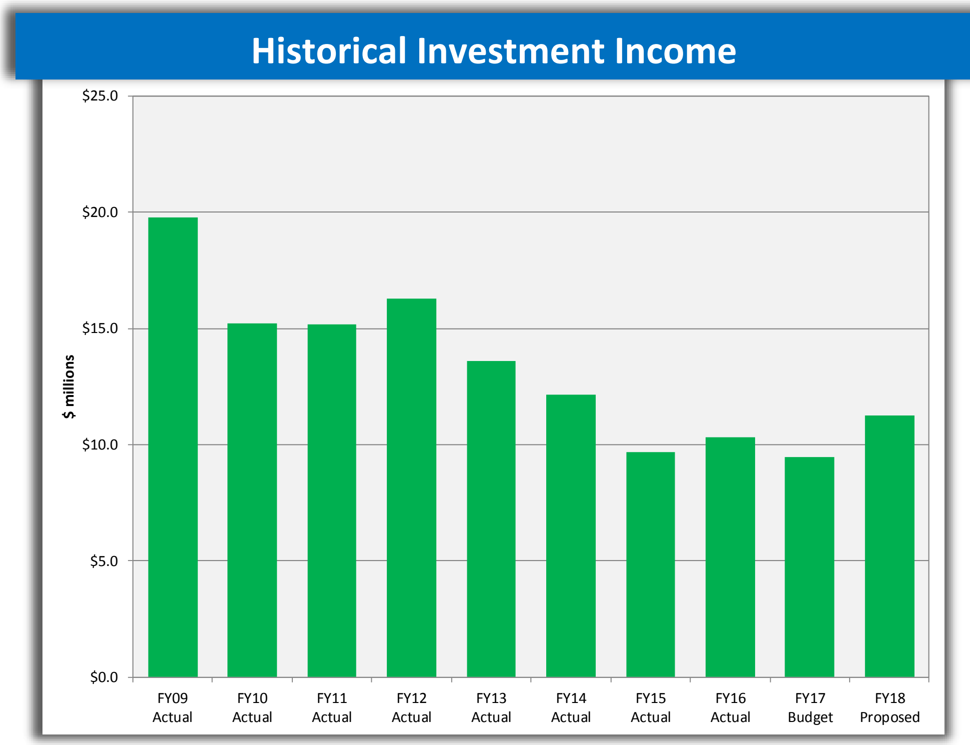


Figure 51

The Advisory Board, therefore, recommends reducing interest income revenue by $1.6 million.

Debt Service Assistance

- Debt Service Assistance (DSA), when available, is treated as an offset to debt service
- No DSA was assumed in the proposed FY18 CEB
- Since 2004, the Authority has received an average of 79% of the statewide DSA funds available
- In FY17 DSA was funded at a statewide level of $500 thousand
- The MWRA received its share of DSA in the spring of FY17 totaling $391,580

In keeping with the policy advocated by the Advisory Board to "Pay It Forward" to the next budget year, the Advisory recommends that $391,580 be used to directly reduce the rate revenue requirement for FY18.

Policy Section

Enterococcus Treatment at Deer Island

"Regulation for Regulation's Sake"

In Brief

The Authority is anticipating changes to the Deer Island NPDES permit (current permit is 13 years old) starting in December 2017 or January 2018. One of the biggest changes may be the addition of a new indicator bacteria called Enterococcus. Like fecal coliform, high levels of Enterococcus show when the effluent is potentially toxic to marine life or harmful to human health through primary contact, like swimming. Using this type of bacteria as an indicator has become more prevalent throughout Europe and the US. The question is whether an Enterococcus limit should be applied to Deer Island's outfall, which is located 9.5 miles off the shore. Below, we explain why this particular limit does not make financial or environmental sense.

In Depth

Potential changes to Deer Island's NPDES (National Pollutant Discharge Elimination System) permit could usher in enormous consequences for the Authority's operations and finances. The permit allows the discharge of treated wastewater into the bay. Both EPA and MassDEP determine the terms of this permit. The effluent travels 9.5 miles through an underwater tunnel before being released through diffusers. To be clear, Deer Island is in the minority, as the vast majority of other wastewater treatment plants typically discharge into nearby surface waters. For comparison, the Cohasset Wastewater Treatment Plant, which is located along the South Shore, empties its effluent into Cohasset Cove, clearly much closer to shore than Deer Island's outfall. Similar to Cohasset, the wastewater treatment plants at Lynn and Salem release their effluent into nearby coves.

At Deer Island, the Authority rigorously tests this effluent to make sure limits are not exceeded. They are obligated to test for fecal coliform, which is a bacterium found in human waste. High levels would mean the water isn't clean enough to be discharged into the bay, and can pose a risk to human health if ingested. In addition to mandatory testing for fecal coliform, MWRA also tests three times daily for another indicator bacteria called Enterococcus. While Enterococcus is not yet in the NPDES permit, MWRA is preparing for any changes to the permit in the future. Increasingly, in Europe and

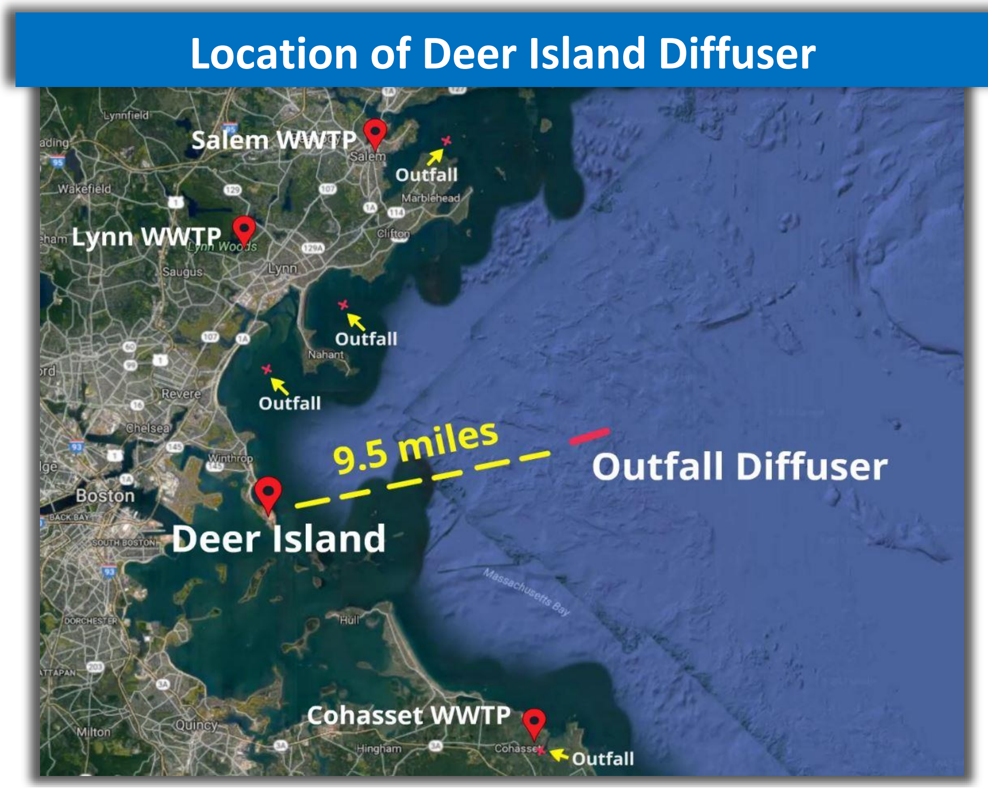


Figure 52

across the United States, regulatory agencies are using Enterococcus, rather than fecal coliform, as the standard indicator bacteria.

The results of Enterococcus sampling in Deer Island effluent reveal a telling story. Using the 2000 Massachusetts limit set for shellfishing and swimming as a comparison, the Authority found that between 2008 and 2016, there was only one month where the effluent's monthly average exceeded the Enterococcus limit. This exception occurred in March 2010. Meaning, no other monthly average between 2008 and 2016 exceeded this limit.

In addition, the effluent data shows a very distinct seasonal trend, with Enterococcus levels at their highest in the winter and spring, and their lowest in the summer and fall. This is likely due to the fact that the chlorine-based process to remove bacteria is most effective in warmer temperatures. This means that during the summer and fall, when the effluent is at its highest temperature, more bacteria will be removed.

Besides temperature, the other factor is contact time. Longer contact time during disinfection means more bacteria killed. Since wastewater flow is lowest in the summer, there is longer contact time. Combined with the warmer temperatures, this leads to lower bacteria levels in the summer.

If we turn to examine more closely the one monthly average when the limit was exceeded, it turns out March 2010 was marked by record-breaking storms. Some MWRA communities received up to 18 inches of precipitation. The excessive flows meant much shorter contact time, plus cooler temperatures in March. This led to the highest Enterococcus levels recorded between 2008 and 2016.

Knowing this about the effluent, the question evolves to whether there are any detrimental effects on the Bay. The Authority has also sampled Enterococcus in the bay where the effluent is released. The samples have either been non-detects, or very low compared to the effluent numbers. Unlike with the effluent, there have been no seasonal trends in the bay. Therefore, one could safely conclude that the Enterococcus in the effluent has no significant effect on the Enterococcus in the bay.

An amended NPDES permit at Deer Island would result in consequential logistical and financial changes, namely the delivery and use of more chemicals. While more chemicals can lead to 100% Enterococcus sterilization, there would be additional, more damaging side effects as a result.

First, two types of chemicals are used in this process: sodium hypochlorite to kill the Enterococcus, and sodium bisulfite to remove the extra chlorine from the first step. Even after dechlorination, this higher dose of chemicals can still create toxic effluent that can put marine life at risk. Such high doses can lead to long-lasting, chronic consequences. This jeopardizes future populations in the name of "clean water."

Second, more chemicals to treat Enterococcus means more chemical deliveries through the town of Winthrop. Currently, Deer Island receives about 280 trucks per year for sodium hypochlorite and sodium bisulfite. If Enterococcus is added to the NPDES permit for all of FY18, this will mean 200 more trucks, or a 71% increase.

One might wonder whether barging would be an option given all this proposed additional trucking traffic. Unfortunately, there are currently no vendors who offer bulk chemical delivery via barge. If any vendors did emerge, Deer Island would have to replace their existing pipelines to deliver the chemicals from the pier to the facility. This would cost between $3 and $5 million, in addition to any extra barging charges from suppliers.

Finally, the costs to provide for these chemical increases are not trivial. The Authority is budgeting an extra $600,000 for Enterococcus treatment for the back half of FY18, assuming the new NPDES permit goes into effect in December or January. Going forward, this number represents up to $1.3 million per year, a significant and unnecessary cost to ratepayers over time.

It is crucial to remember that the water quality standards exist to protect human and ecological health. Using excess chemicals to treat something that has only been an issue when no people would be exposed undermines the purpose of the standards in the first place. Enforcement of such a situation would be regulations for regulations' sake, coming at the cost of marine life, and causing more traffic, emissions, and headaches for the town of Winthrop.

If Deer Island were like other wastewater treatment plants, the effluent would be released into nearby surface water, such as a stream or off of a shoreline. Recall the examples of Cohasset, Lynn, and Salem. However, Deer Island is totally unlike other wastewater treatment plants. We would concede that Deer Island should meet Enterococcus limits if the outfall were in the immediate vicinity of human contact. But hardly any human will be swimming near the outfall, whether in the depths of March or the peak of July. The same standards for public health possibly could not possibly apply.

Given the predictable nature of Enterococcus throughout the year, a seasonal permit (when human contact is more likely to happen) is another option. However, the important to thing to remember is that just because a seasonal permit could work here, doesn't mean it should be applied. This type of limit for wastewater treatment plants exists at other facilities. For example, the Cohasset Wastewater Treatment Plant has a seasonal Enterococcus limit between June 1 and September 30. And at least 19 wastewater facilities in Maine have seasonal fecal coliform limits, including two in Portland and three in Bar Harbor, and they are in effect between May 15 and September 30. Even so, a seasonal permit is out of place at Deer Island, as human contact is extremely unlikely any time of the year. Along with the fact that the outfall Enterococcus level has no effect on the Bay level, these two particulars should be enough to exempt Deer Island from Enterococcus limits in a revised NPDES permit.

The Advisory Board recommends that the MWRA removes $600,000 from its chemicals budget for FY18 to reflect an exemption that would not require Enterococcus treatment.

In Conclusion

Looking at this case, an Enterococcus limit could not in good conscience be called an appropriate regulation. Regulations should be productive and contribute to the common good. It's important to step back and ask what limit is appropriate, and where. And this limit would neither be a wise use of money or chemicals. The Authority is responsible first and foremost for providing water and sewer services to its customers, not furnishing swimming-quality water 9.5 miles off shore. The Enterococcus waiver for Deer Island is the fiscally and environmentally responsible thing to do. The Advisory Board recently put together a brief informational video that further details these arguments, which can be found here: https://vimeo.com/214004690

Cross-Harbor Electric Cable

"What the HEEC?"

In Brief

The cross-harbor cable providing power to Deer Island has been a risk factor flagged by the MWRA and the Advisory Board for several years. A project to dredge and deepen the shipping channel revealed that sections of the cable are not as deep as they should have been, resulting in legal challenges involving the MWRA, Eversource, MassPort and the Army Corps of Engineers. Federal funding for the dredging project hinges upon an agreement between Eversource and MWRA on a course of action to address the issue. After much discussion, the MWRA and Eversource came to an agreement to install a new cable providing power to Deer Island. Below, we go into greater detail about what led to this decision, and outline our concerns and our recommendations on this approach.

In Depth

History and Background

The cross-harbor cable is Deer Island's primary electric power source and is located in the Reserved Channel and Boston Harbor. Installed in 1989-90 by Boston Edison, it was a key milestone in the Boston Harbor Cleanup Project. It is owned and maintained by the Harbor Electric Energy Company (HEEC), a subsidiary of NSTAR both operating as Eversource Electric. By the terms of the 1990 agreement among NSTAR, HEEC, (together "Eversource") and MWRA, the MWRA has made payments every year through 2016 when that agreement expired and was replaced by a DPU tariff. A large portion of these payments was related to paying off the debt service funding the installation of the cable; in 2015 the last of HEEC's bonds were paid off, and MWRA's capacity charge payments are now much lower. The cable is over 27 years old, but a submarine cable could potentially have a useful life almost double that.

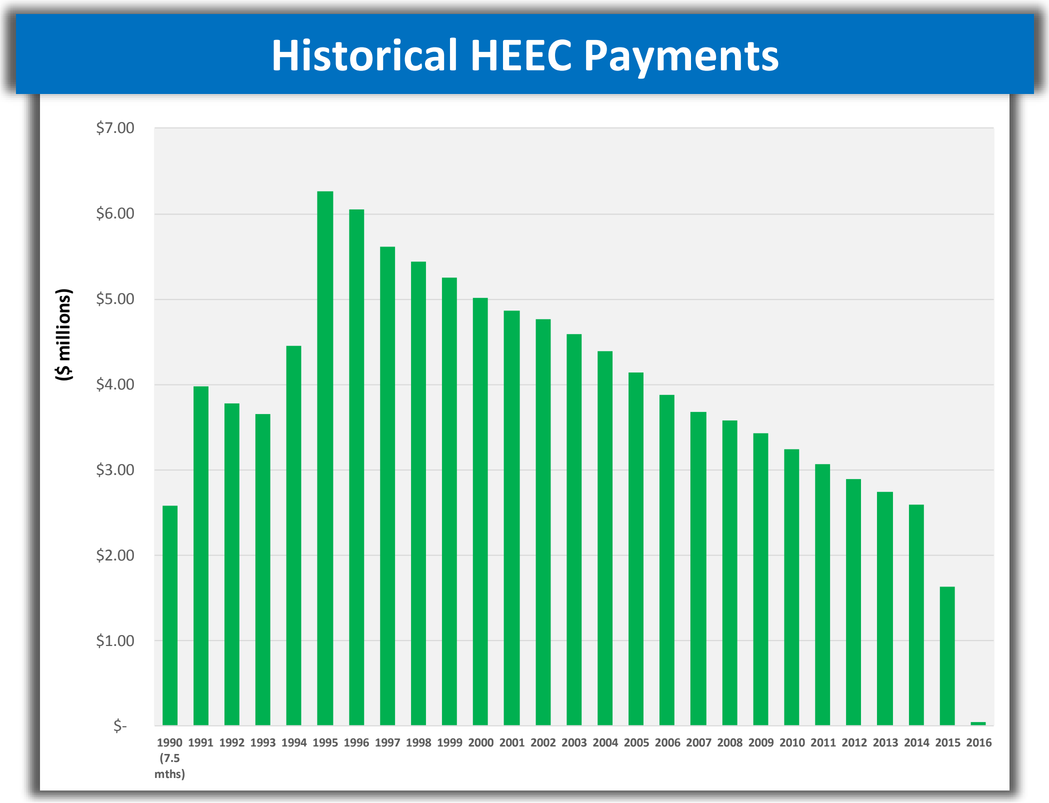


Figure 53

In past years, MassPort and the U.S. Army Corps of Engineers (ACoE) have been planning a dredging improvement project for Boston Harbor including the Reserved Channel. Once deepened, the harbor would allow larger ships to pass through and enter the harbor. While preparing for this dredging project, it was discovered that the cross-harbor cable as installed was shallower in some locations than the depths required by its Army Corps permit.

After many years of discussions about the permit and ways to perform the dredging project without harming the cable, the ACoE commenced a lawsuit against MWRA and Eversource. We should note that the MWRA is being sued because it is listed as a co-permittee on the Army Corps permit for the submerged cable though MWRA does not own the cable, did not install the cable, and was not aware that the cable's depth was not in compliance with the permit - a concern that raises concerns for us as relates to other joint permits (see Professional Services Policy Point discussion on Co-Permittees, page 88).

Costs to address the issue would be high, and Eversource and MWRA both disputed who should bear these costs. MWRA maintained that HEEC was responsible since its installation did not meet the Army Corps permit, and the Advisory Board went on record multiple times stating "ratepayers pay for projects once." The magnitude of these costs remained unclear while an approach to address the non-compliant sections was determined. Relocating the cable to a lower depth was mentioned early on, but the preferred approach had long been to protect the cable by installing concrete mats above the at-risk sections.

Despite the ongoing legal dispute regarding who would ultimately pay for the cable protection costs, MWRA and Eversource continued working on options defining the project and schedules for completing the cable protection project. Compounding the issue, federal funds dedicated to the harbor dredging project were placed on hold until MWRA and Eversource agreed upon a final plan, which has most recently added a sense of urgency to the cable protection project.

The MWRA included funds in the proposed FY18 CEB to address potential cost impacts to MWRA as a result of the cable protection project. Eversource had proposed to pick up the costs of armoring the cable (about $40 million), and the MWRA would have been asked to absorb operational costs to adjust to this work which included additional overtime as well as substantial fuel the costs to run the on-island generators to power Deer Island, while the cable was de-energized for construction. The MWRA included $4.4 million in its proposed FY18 CEB as a placeholder for these potential costs.

Originally, this $4.4 million placeholder assumed the potential for both a four month construction schedule and that the cable would be reenergized during severe storms, reducing MWRA's operational costs. Unfortunately, the costs and risks to complete the project increased significantly as discussions continued. By March 2017, Eversource reported that the cable protection project's duration would increase significantly from the original timeframe, now projected at seven month construction periods over two years, and would require full access to the cable 24 hours a day, 7 days a week.

This proposal for 24/7 access would have dramatically increased the MWRA's potential costs because the Deer Island NPDES permit requires the plant to have backup power at all times. Assuming Eversource was to de-energize the cable only during non-peak times, Deer Island could easily manage plant flows with one CTG, reserving the second as the backup power source. Under the original proposal, the cable would be reenergized during peak events like storms to provide primary power to the plant, with the CTGs running in parallel as the backup power source. However, if the cable could not be reenergized during peak events, the MWRA would have had to use both CTGs as the primary power source, thereby making it advisable, if not necessary, to rent additional generators to provide backup power. Given the size and requirements of the plant, the generators would have had to be rented for the entire duration of the project, and would have added millions of dollars to the MWRA's costs. Extending construction from one year to two would have effectively doubled this already large increase. The worst case scenario would have added $55.9 million to the MWRA's costs over two years, and caused the FY18 sewer utility increase to jump from 3.7% to 11.3%.

The final "curve ball" in this plan was how much time the cable protection project would buy the Authority. The MWRA learned that there were already reliable predictions for a subsequent dredging project within the next decade, with new depth requirements that would render even a protected cross-harbor cable unviable and would require constructing a new cable at a lower depth. MWRA staff, Advisory Board staff, and the MWRA Board of Directors all agreed given the ballooning costs of the cable protection project that the costs far outweighed the benefits of protecting the cable. A new solution was required.

MWRA and Eversource staff engaged in new discussions on the option to construct a new cable rather than protecting the existing one. While this option made logical sense, it introduced many additional components to negotiate. If you recall, the cable was 27 years old and potentially had many remaining years of additional useful life. The Authority - through its communities and ratepayers - had already "paid off the mortgage" so to speak on the current cable only to find they now needed to purchase a new one, and rightfully expected to receive some compensation for the lost value of the remaining useful life. Costs to remove sections of the old cable entered into the discussion, as well as the interest rates being charged to the MWRA. Lastly, as part of the court case, MWRA had already contested the incentive payments Boston Edison received for completing the original cable ahead of schedule, especially in light of the cable's failure to comply with the ACoE permit's depth requirements.

To meet a May 10 deadline, the MWRA Board of Directors moved its regularly scheduled meeting to May 8, 2017 when it discussed and approved an agreement with Eversource.

Project Costs and Financing

The agreement with Eversource estimates the total project costs at approximately $114 million including both construction of the new cable as well as removal of the required sections of the old cable. The MWRA negotiated a $9 million cap on the old cable removal costs, which is included in the $114 million. Moreover, this agreement also credits the MWRA $17.5 million for both the value of the unutilized life of the cable ($14 million) and the original construction incentive payments ($3.5 million). By negotiating this $17.5 million credit the MWRA will save about $30 million over the 30-year HEEC payment schedule. After subtracting the credits from the total project cost, the net estimated cost of the project is $96.5 million.

Financing of the net $96.5 million will be split – 50% will be self-funded by MWRA and 50% will be financed by Eversource who will recover the costs through annual charges to the MWRA. Funding half of the construction costs itself provides a key source of savings for the MWRA. Every business must receive an economic "return" from its investments, and Eversource expects to collect a rate of return on the value of the investment, projected at 9.67%. Rather than pay this rate on the full $96.5 million, the MWRA will only pay the rate of return on Eversource's half of the investment ($48.25 million). By self-funding its half of the cable costs, the MWRA will save about $40 million over the 30-year payment schedule. The MWRA also expects to see about a $15 million savings associated with other terms negotiated in the contract. Altogether, the MWRA's negotiations will lead to an expected total savings of $85 million over the 30-year payment schedule thanks, in large part, to the credit and financing arrangements.

Beyond the financial terms of the agreement, the MWRA negotiated one other "win" we should mention. As noted before, the reason the MWRA was a party in the suit from MassPort and ACoE was due to language in the cable's permit that named MWRA as a co-permittee with Eversource. This was an important negotiation point for any new agreement, and the MWRA ensured that it would not be named as a co-permittee for the new cross-harbor cable. Additionally, once the required sections of the existing cable are removed, MWRA will ultimately be removed from the permit for the old cable as a named co-permittee.

There are, however, some complexities to be aware of. Because the cable is not the MWRA's asset (both the original and the new cable are the property and asset of Eversource), it cannot be funded with tax-exempt bonds, which are currently the only bonds traditionally issued by the MWRA. As an alternative, the MWRA has proposed using Current Revenue for the Capital Program or Pay-As-You-Go ("Pay-Go"). Last year's *Comments* explain in great detail the nuances of Pay-Go. In fact, last year one of the Advisory Board's recommendations was to have a more detailed and justifiable accounting for what projects were funded via Pay-Go.

The Advisory Board supports the MWRA's plan to use Pay-Go to fund its share of the new cross-harbor cable construction currently estimated at $48.25 million.

While the Advisory Board is pleased that dedicating Pay-Go toward this project for the next few years will fulfill last year's recommendation to have better accounting for the specific application of Pay-Go funds, it is also concerned that this may limit the Authority's options during this period. Other capital projects similarly not eligible for tax-exempt bond funding are percolating including the community Lead Loan Program[18] as well as potential work on the private railroad running through the Wachusett watershed.

The Advisory Board recommends Pay-Go funding levels are not increased beyond those currently in the MWRA's planning projections. The Advisory Board reserves its right to recommend reduced Pay-Go levels in future.

While the MWRA saves costs by self-funding 50% of the project, the other 50% will be financed through Eversource and charged to the Authority as part of an annual capacity charge, similar to the first cable agreement. Current projections

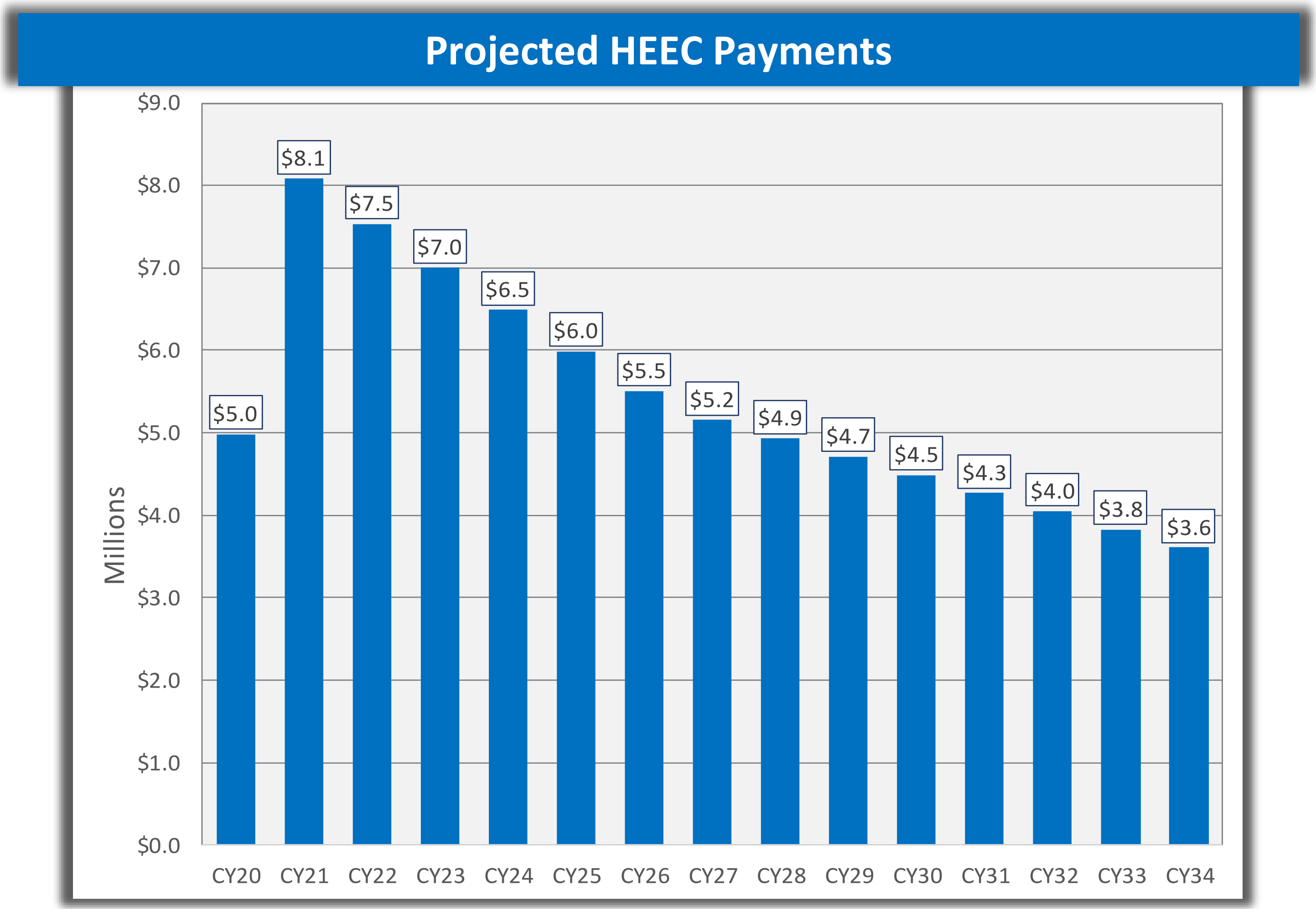


Figure 54

(see Figure 54) indicate that these charges will begin within the next few years and are significant. Though not as severe

[18] Any work being conducted with LLP funds on private property is not eligible for tax-exempt funding.

as the cable protection project scenarios mentioned above, these increases could cause "rate shock" and funding challenges if not properly prepared for. Fortunately, this proposed budget provides an opportunity to do just that.

First, as mentioned before, the Authority had already included $4.4 million in the proposed FY18 CEB for the cable protection project operational costs. Now that the MWRA has reached an agreement with Eversource to construct a new cross-harbor cable, these funds are no longer needed for their original purpose.

The Advisory Board therefore recommends transferring $4,419,124 to a HEEC Capacity Reserve fund to be used specifically for the first payments due to Eversource related to the new cross-harbor cable annual charges.

Transferring these funds from their corresponding line items into a dedicated reserve fund means they are no longer subject to the terms of the Operating Reserve Requirement. Our recommendation in the Indirect Expenses Chapter to reduce the Operating Reserve Requirement takes into account this adjustment.

Figure 54 indicates when these charges will occur; however, we should point out that new HEEC agreement will be a calendar year document, while the Authority's budgets are based on the fiscal year. An average of the first two calendar years' (FY20 and FY21) costs totals $6,532,146. Having already transferred about $4.4 million into the HEEC Reserve Fund, this leaves a balance of approximately $2.1 million to find to avoid future "rate shock."

The Advisory Board recommends adding $2,113,022 to the HEEC Capacity Reserve fund to be used specifically for the first payments due to Eversource related to the new cross-harbor cable annual charges.

The Advisory Board does not take adding funds to the final budget lightly; in fact, we have already identified $4.6 million in reductions across various line items. However, the Advisory Board also takes a multi-year approach to avoid wide variations in year-to-year rates. Candidly, removing $2.1 million from the proposed FY18 would reduce the rates to 2.9%; however, it would also raise FY19's increase to nearly 5%, which would be the largest increase in ten years. Once we add $5.0 million in new HEEC payments in FY19 the rate catapults over 5%, which would be the highest rate increase in 14 years. Extreme short-term gain would cause multi-year pain.

By redirecting the cable-protection project funds as well as some of the cuts the Advisory Board has identified toward a HEEC Capacity Reserve Fund, we will avoid "rate shock" and still achieve the lowest rate increase in five years, while preserving our options to keep rates sustainable and predictable for both FY19 and FY20.

In Conclusion

The costs and risks to relocate or protect the existing cross-harbor electric cable were extremely high, and would only provide a temporary reprieve from the construction of a new cable. The Advisory Board appreciates the MWRA's successful negotiation of an agreement with Eversource that will install a new cable with financially fair and beneficial terms. We support the Authority's funding strategy at currently projected Pay-Go levels, and further recommend ways to avoid "rate shock" when the MWRA begins paying the new HEEC capacity charges.

Wastewater Primacy

"Moving the Discussion Forward"

The Advisory Board has long advocated for the Commonwealth of Massachusetts to obtain delegated authority, or primacy, over the National Pollutant Discharge Elimination System (NPDES) permits. This stance was echoed by a 2013 joint commission organized by the Legislature and MassDEP. This group included a broad range of stakeholders, including members of the regulated community, environmental advocates, budget and fiscal experts, municipalities, and legal authorities. The study it produced identified some challenges associated with state primacy, along with the undeniable benefits of such a move.

One of the chief advantages identified was perceived ability of communities being able to work more effectively with MassDEP than with EPA. Thus, primacy would allow the Commonwealth to achieve compliance with the scope of federal regulation but at a pace tailored to the specific needs of Massachusetts communities. Now more than ever, given the uncertain status and funding of the EPA, it is critical for Massachusetts to join the 46 other states and take the lead regulatory position on wastewater issues.

Our support of state primacy, however, comes with the recognition that it must be coupled with a dedicated non-general state funding source. In the Northeast, Connecticut and Vermont support their state NDPES programs with a combination of an annual compliance or operating fee, a permit application fee, and federal funding, in addition to a state general fund. While Maine does not include a permit application fee in its funding, the funding does include 26% in fees, 26% in the state general fund, 41% in federal funding, and 7% coming from other sources. Other states, such as Idaho and Alaska, rely more heavily on federal funding (69% and 61%, respectively). While exact proportions may differ, this type of diversified breakdown of funding sources is critical to creating and sustaining a state-delegated program.

It behooves the environmental community, our state leaders, and all the many stakeholders to roll up our sleeves and develop a dedicated fee structure. In our attempt to get the discussion started, we offer a conceptual plan for such a fee structure (see Figure 55). The biggest source of funding at 40% would come from publicly owned treatment works (POTWs), including the MWRA and cities and towns. The proportion of funding could be determined from the three-year flow average to avoid wide swings from year to year in calculated fees. Twenty-five percent of funding would come from EPA and MassDEP through a dedicated contribution and in-kind services.

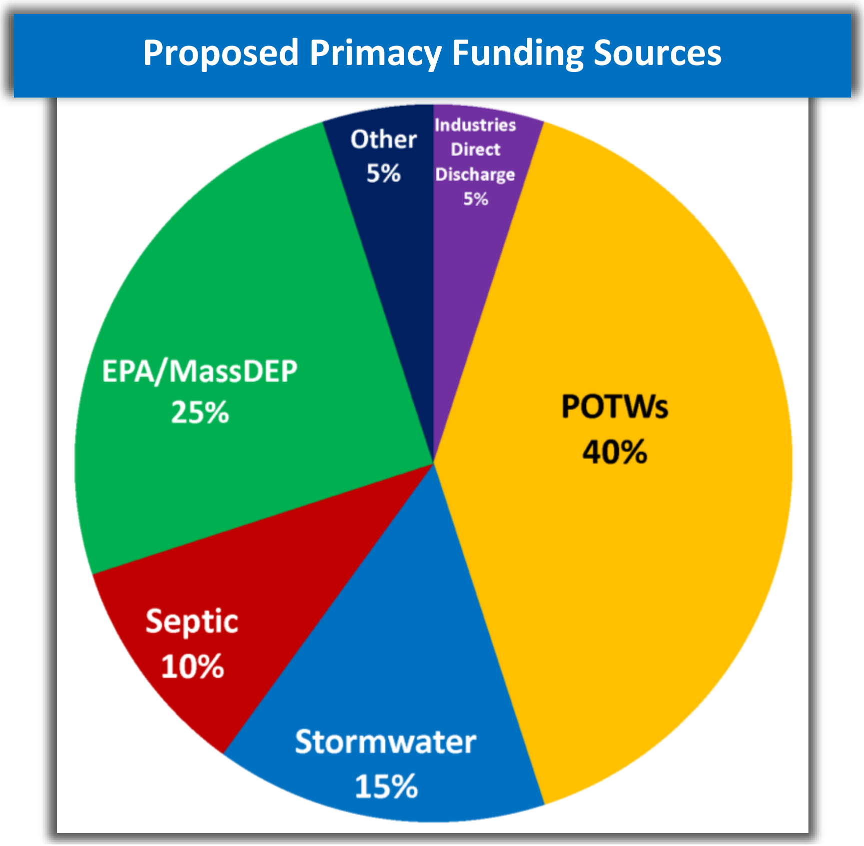


Figure 55

Funds from stormwater-related sources would comprise 15% of the primacy program. A stormwater fee could be based on a number of factors, including the size of the community, number of discharges connected, population size, flow, impervious surface, and recharge area. Similarly, a septic fee would be 10% of the funding and based on the number of septic users.

The remaining 10% would come from industries (again based on discharge) and other sources to be determined. There could be sources that should contribute that haven't even been considered yet, so it's important to keep an open mind when developing this structure. One idea is to incentivize good behavior through rewards. Conversely, sanctions could be applied to any parties not being a "good actor" under the program.

Since the Authority has such a large sewer flow footprint, it makes sense that it would contribute significantly to funding the program. However, MWRA's other contributions, such as with harbor monitoring, should also be recognized in the form of credit.

This model acknowledges that there are many permittees with varying levels of impact. This is by no means intended to be the last word on the matter, but rather the starting point. The discussion on primacy has been stalled long enough. It is time to move forward and turn conceptual ideas of funding into a reality.

The Advisory Board expects to work closely with the MWRA and all stakeholders to help MassDEP assume NPDES delegation.

Professional Services Procurement

"Can We Design a Better Mousetrap?"

In Brief

The MWRA Board of Directors has recently expressed concern at some of the professional services procurements being brought forward for approval. In some instances, a lack of competition has been at issue, and in others the role of cost versus other criteria have been debated in depth. As part of this year's review, the Advisory Board examined the MWRA's procurement process comparing it to other state agencies as well as other options to determine if any changes should be recommended.

In Depth

MWRA's Current Process

As part of this review, Advisory Board staff met with MWRA Procurement staff as well as attended the Authority's Professional Services Selection Committee training to gain an in-depth knowledge of the process as it currently exists. The MWRA defines "Professional Services" as:

> *All contracts for services in which the party providing such services must have advanced or specialized degrees or knowledge in order to properly provide the services required.*

Procurements with an estimated value of over $25,000 require a selection committee. The MWRA uses two different processes for these procurements:

1. "Combined" RFQ/P: A one-step process where proposers submit both their detailed cost and technical qualifications in one submission package, based upon a detailed scope and contract
2. RFQ-RFP Process: A two-step process where respondents first submit a general technical approach to the scope as well as their team's qualifications, which is reviewed by the Selection Committee. The committee "short-lists" three or more most qualified proposers and finalists submit detailed qualifications, technical, and price proposals.

The process used depends on what is being procured, how many consultants are out there that might be proposing, among other factors.

The MWRA employs what it terms a "best value" evaluation, which includes subjective weighted considerations, not simply taking the low bidder. The MWRA has very specific procedures for the evaluation and selection process with the goal of making sure the procedures are followed in a fair and transparent manner.

The Selection Committee is typically made up of MWRA employees, but has sometimes included MWRA Board of Directors members or Advisory Board staff.[19] Committees vary in size. For procurements under $100 thousand, the committee usually has three voting members. For procurements over $100 thousand, the committee usually has five or more voting members. Selection Committee composition aims to represent a cross section of staff and stakeholders, but no departmental group (e.g. Engineering or Finance) may have majority representation on the committee.

The evaluation process has two stages: independent and group. Selection Committee members first conduct their own scores for each proposal with instructions to give each proposal the same consideration, to be fair and consistent in their

[19] Advisory Board staff's participation has generally been limited to finance-related professional services procurements

evaluation, to limit scoring only to criteria in the RFP, and to fairly evaluate all proposals against the requirements of the RFP.

After this independent review is complete, the committee meets as a group to discuss and deliberate the proposals. At this time, the committee members are allowed to adjust their scores based upon any new insights gained from group discussions; however, any changes must be accompanied by a written justification for any changes to individual scores.

Evaluation criteria can include:

1. Cost
2. Qualifications and Key Personnel
3. Experience and Past Performance
4. Technical Approach, Capacity, Organization, and Management Approach
5. Participation of Minority- and Women-owned Businesses

The Selection Committee has the option to add additional criteria or change the weights of criteria with certain restrictions. MWRA's Affirmative Action group determines the minimum percentages for M/WBE participation as a weighted factor. Procurement and the Executive Office set the minimum percentages for cost as a weighted factor. A Selection Committee may increase the weight of cost as a criterion, but may not reduce it below the minimum; moreover, no other factor may be weighted higher than cost according to MWRA's procedures. Other factors may be weighted the same, but may not exceed cost. The MWRA emphasizes in its training that the lowest cost proposer doesn't necessarily receive the highest points.

Qualifications-Based Selection

As part of our review we compared MWRA's "best value" selection with that of Qualifications-Based Selection (QBS). QBS is promoted and touted by the American Public Works Association (APWA), the American Council of Engineering Companies (ACEC), and many other agencies, all of which

> *believe that the public interest is best served when governmental agencies select architects, engineers, and related professional technical consultants for projects and studies through Qualifications-Based Selection (QBS) procedures. Basing selections on qualifications and competence (rather than price) fosters greater creativity and flexibility, improves the delivery of professional services, increases the value to the owner in construction and life cycle expenses, and minimizes the potential for disputes and litigation. – APWA Red Book on Qualifications-Based Selection*

The *APWA Red Book* makes the case that the price of design is not as significant as its quality, because the quality of "quality of design has a profound influence on both construction price and operation/maintenance cost." Further, it likens professional services to services such as law or medicine, arguing that the lowest price does not always indicate the best choice for such services. It submits that QBS still allows for a competitive process, but rather than competing on price as with construction contracts or vehicle acquisition, firms compete based on qualifications.

The *Red Book* notes that either RFQ or RFP processes can be used, and while costs for RFQ are low to moderate for submitting firms, RFP processes can be much higher depending on the size and complexity of the project. It notes that an interview with competing firms is often part of the selection process, and recommends that each firm's presentation should cover:

- Understanding the work at hand
- Approach to the design or problem
- Tentative work elements

- Work sequence
- Past experience on jobs bearing on the subject project or study
- Identification of person in responsible charge of the work
- Projected office workload and staff availability covering the expected period of work
- Personnel and time schedules
- Location of offices where the work will be done
- Proposed subconsultants
- Unique qualifications of work methodology
- Experience in developing and working within an interactive project process
- Track record of bringing in projects on time and within budget
- Experience relating to public clients on similar work
- Quality control

It also mentions different fee and payment structures that are sometimes used ranging from percentage of construction cost (noting that this is less prevalent today), actual cost plus fixed fee (noting that that the close monitoring required with this method is usually more onerous than practical for local agencies), "salary cost x a multiplier + incidental costs" (noting that "upset maximum" figures should be included), and lump sum or fixed fee (noting that this requires the greatest level of advance negotiation and a very clear definition of scope of services). Whichever method is selected, the *Red Book* asserts that "no reasonable basis exists for discussion of specific fee figures until the scope of services has been fully developed through contract negotiation with the selected consultant."

Though price is not negotiated before a firm is selected and the scope is more clearly defined, if a final price cannot be agreed upon, the awarding agency can always walk away. If an agreement is not reached with the top ranked firm, the agency can then enter into negotiations with the second ranked firm, and so on down the line.

Other Agencies

As part of the research into this topic, Advisory Board staff also reached out to other state agencies to learn how they were procuring for professional services. The Massachusetts Department of Transportation (MassDOT), Massachusetts Port Authority (MassPort), and the Massachusetts Bay Transportation Authority (MBTA) all utilize QBS for these procurements. An important caveat is that these agencies are required to use QBS. In 1972, the Brooks Act required any designs using federal funds to select consultants based on qualifications, not cost. More recently, a state law similarly required both MassDOT and the MBTA to do so even when federal funds were not being used.

The MassDOT staff we spoke with indicated that QBS has worked well for them. They indicated that negotiations with firms centered around work hour effort rather than dollars. One thing MassDOT noted was that it makes heavy use of task order contracts selected through QBS. By having several firms on various task order contracts, MassDOT can reach out to a firm under their contract and give them a specific assignment or design. The fee is negotiated individually on this assignment. Sometimes for larger solicitations they will do a standalone procurement; however, they found that sometimes reduces the number of proposals they receive. The task order contracts have varying time limits from three up to five years, with options to extend both for time and for money.

Three years ago, MassDOT staff reported that they had gained some additional flexibility with their contracts. Task contracts had a limiting amount – $1 million for certain types of services; however three years ago the agency implemented "master agreements" which had no limiting fees. The agreements basically constituted a contractual obligation with the company to perform a service. Under these agreements, each assignment functions almost like a separate "mini contract" without worrying about the cost, which is helpful for some of their needs as it relates to bridge and roadway design.

MBTA staff reported that they had greater restrictions than MassDOT on their contracts. They have historically had $5 million caps on their General Engineering Contracts (GEC), but are now increasing them. Also in the past, assignments under task order contacts over $1 million were done on an emergency basis. Now, they have a new process for task order assignments over $1 million. They approach 2-3 of their GEC firms and request a three-page letter, organizational chart, and a schedule for how they would deliver that service. The firms have two weeks to respond. The T's new Fiscal and Management Control Board requested this new approach to assignments over $1 million. MBTA staff also noted that they used to use a two-step RFQ/RFP process similar to the MWRA's, but they found it to be too onerous for small firms. They didn't feel like it saved much staff time using that method, and it was a lot of work for firms who submitted but didn't make the short list.

Why Now?

The Authority has used its current professional services procurement approach for decades, arguably with great success. While every process should be examined periodically to make sure it is still the best process or if it can be improved, recent discussions at the MWRA Board of Directors have elevated this issue. Over the last year or so, there have been a number of professional service awards where only one or two firms had submitted proposals, causing Board members to express concern. To its credit, the MWRA has also looked into how other agencies conduct their processes as a result of these conversations. Procurement staff have also discussed contacting firms after bids to identify the specific reasons why they may have ultimately passed on a project.

The Advisory Board sees many pros and cons to the different processes reviewed. First, the Advisory Board appreciates the Authority's diligent focus on its primary source of funds. By having cost as a component, and not able to be exceeded in weight as a criterion, it pays the ultimate respect to the communities and the ratepayers, who will be funding these projects. Second, there is no doubt that the MWRA's process is thorough, specific, and detailed. According to Procurement staff, feedback from the industry and participants has been that the process is fair and transparent.

Procurement staff also pointed out that many factors exist that may be the cause for reduced competition on some awards. The greater Boston area is seeing a high level of construction and design service needs at this time, both from private and public entities. In addition to this, a firm must look at the contracts it is already working on and determine whether or not it has the available and right staff and resources to undertake a new one.

Procurement has also taken steps to streamline the procurement process where possible. In addition to its movement toward paperless operations, it has begun to make non-sensitive documents available electronically to make prospective firms' task easier.[20] It is looking into ways to streamline some submittal processes where possible as well.

That said, there are clearly some challenges, whether wholly or partially caused by the current process. The lack of competition concerns the Advisory Board as it has members of the MWRA Board of Directors. Another concern echoes the experience relayed by MBTA officials – that a full RFP or a combo RFQ/P process is onerous for smaller firms, which could also be contributing to the reduced competition.

That said, the Advisory Board is not altogether convinced that removing cost as a component and awarding purely based on qualifications for all professional services is the best option. As noted before, the MWRA has had some great design work performed under the current procurement policies. Also, as noted before, the other state agencies we looked into

[20] All documents are reviewed for sensitivity, and are made available only to firms that sign the requisite nondisclosure agreements as well as log in through a secure web portal.

don't necessarily exercise a "pure" form of QBS as found in the *Red Book*. They have adapted QBS to suit their agency's individual needs. Moreover, they are prohibited from using cost as a criterion for evaluating submittals.

The Advisory Board is also aware that the MWRA has, on more and more occasions, reduced the weight of price as a factor when it might encourage more participation in procurements. By the terms of its policies, no other factor can be weighted higher than cost, but by reducing it as a factor, Procurement staff points out that for many selections, the other criteria vastly outweigh cost.

Procurement staff indicated that they like the flexibility the current procurement policies provide. They can reduce cost as a factor when certain procurements might be at risk for reduced participation, while acknowledging the importance of carefully using ratepayer funds.

The Advisory Board actually wants to give the MWRA more flexibility in its procurement procedures for professional services, with the aim of addressing some of the concerns we have raised. The MWRA's approach to include cost and to ensure no other factor can be higher seems to work well in most cases. In certain cases, the Advisory Board would like the Authority to explore the option to allow other factors to exceed price, or even to conduct some professional services selections where price is not a factor at all. The Advisory Board would like to encourage more competition for procurements that tend to have low participation, to encourage and make it easier for smaller firms to participate, and to ensure that on particularly important, long-term, and sensitive projects that the Authority secures the most qualified firm to perform the services required. The Advisory Board would also encourage the collection of data regarding firms' reasons for turning down projects, as such information could be analyzed and used to better tailor proposals based on firms' needs.

Therefore, the Advisory Board recommends that the Authority continue reviewing its procurement procedures for Professional Services contracts, particularly with regard to capital projects considering the following options:

- **Identify some capital project design contracts at different levels of estimated cost and complexity and conduct pilot tests of a qualifications-based selection process, and report back to the Board of Directors on the results and observations of such a pilot, its potential applications at the Authority on a limited basis, and modifications to a "pure" QBS process that might better suit the MWRA's needs**
- **Consider case-by-case waivers on the requirement that no other factor be weighed higher than cost**
- **Consider using qualifications based selections on certain projects (e.g. highly complex ones such as the Metropolitan Tunnel Redundancy) or on certain types of procurements that might increase the competition and viability of smaller design firms to participate without the onerous upfront costs of putting together a bid proposal**

In Conclusion

The MWRA's "best value" style procurement for professional services has generated some successful designs for long-lasting facilities. Recent concerns over reduced competition and the role of cost as compared to other factors have compelled the MWRA and the Advisory Board to examine the issue in detail. Adding flexibility to the MWRA's current procurement process in certain cases could help address some of these issues and help the Authority to ensure it continues receiving the design service possible.

Symbolic Lights

"Giving a Little Something Back"

Of the many visuals that denote MWRA facilities, from the Charlestown wind turbine to flags waving atop the Weston covered storage tanks, none symbolizes the Authority more than the egg-shaped digesters at Deer Island.

As you fly into Boston or look across the harbor from Castle Island, the unique, ovoid structures most certainly stand out. Why not take this already eye-catching feature to the next level?

For a relatively small investment, we could retrofit the digesters with vibrant accent lights, changing to reflect the different seasons, events, and causes throughout the year. This would allow the MWRA to "give back" a little something to our region, and ultimately enables the digesters to join other Boston landmarks (the Zakim Bridge and the Natural Gas Tank come to mind) as iconic symbols of the area.

The Advisory Board recommends that energy efficient decorative LED lighting be installed on Deer Island, to improve the aesthetics and recognition of the Deer Island digesters as part of the Boston Harbor skyline.

List of Appendices

Appendix A

List of Recommendations

1. The Advisory Board reaffirms its recommendation that the Authority use the Program Management Division, similar to the model used for the Boston Harbor Project, when implementing the Metropolitan Tunnel. (Page 36)

2. The Advisory Board recommends that the $4.8 million non-typical water revenue from FY 2017 be segregated and reserved to fund the Metropolitan Tunnel Redundancy. (Page 36)

3. The Advisory Board expects that the Authority will be prepared to solicit any available new federal infrastructure funding for Metropolitan Tunnel Redundancy. The Advisory Board recommends that the Authority organize as many projects associated with Metropolitan Tunnel Redundancy into one large project, demonstrating the size and need of such asset protection. (Page 36)

4. The Advisory Board recommends reducing the FY18 Rate Revenue Requirement by $4,163,934 resulting in a combined wholesale assessment increase of 3.19%, the lowest rate increase in five years. (Page 50)

5. The Advisory Board recommends reducing the variable rate debt interest rate assumption to 3.25%, and the variable rate debt line item by $1.2 million to reflect this change. (Page 55)

6. The Advisory Board recommends Pay-Go funding levels are not increased beyond those currently in the MWRA's planning projections. The Advisory Board reserves its right to recommend reduced Pay-Go levels in future. (Page 58, Page 107)

7. In keeping with the policy regarding Debt Service Assistance advocated by the Advisory Board to "Pay It Forward" to the next budget year, the Advisory Board recommends that $391,580 be used to directly reduce the rate revenue requirement for FY18. (Page 59, Page 98)

8. The Advisory Board recommends that the Authority adjusts its attrition/vacancy rate assumptions upward by $1,000,000 (includes associated fringe benefits). (Page 62)

9. The Advisory Board recommends eliminating the $1.8 million additional pension payment. The Advisory Board leaves it to the MWRA's discretion whether or not to redirect $1.8 million of the OPEB contribution to address recent losses to the retirement fund. (Page 68)

10. The Advisory Board recommends reducing the "additions to reserves" line item for FY18 by $1,259,061 to correspond to the recommended reductions in eligible line items. (Page 69)

11. The Advisory Board reiterates its recommendation from last year on the capital budget for the Watershed Division with the following conditions:

    - The Watershed Division must implement a formal capitalization policy to clearly identify whether projects should be funded through the Watershed Operating Budget or the new capital budget.
    - The MWRA and Watershed Division should work together to develop criteria on the agency's working relationship on managing capital projects using a tiered approach where some projects are managed by MWRA and some by the Watershed Division. The MOU should be revisited and modified in any way needed to implement this approach.
    - Any projects that meet this capitalization threshold should be removed from the DCR operating budget.

Appendix A

- MWRA must receive a detailed and realistic five-year capital spending plan.
- DCR must implement a five-year capital spending cap for the Watershed Division similar to the MWRA's spending cap. If DCR's capital spending is funded through MWRA's CIP, these projects will count toward the MWRA's capital spending cap. (Page 70-71)

12. The Advisory Board recommends that the Authority decrease the "other services" category of expense by $1,722 consistent with the Advisory Board's final FY18 operating budget. (Page 78)

13. The Advisory Board recommends removing treatment of enterococcus from the FY18 budget and reducing the FY18 chemicals budget by $600,000. (Page 85, Page 103)

14. As such, the Advisory Board is even more strident in its position on co-permittees and instead recommends that MWRA insist that the final Deer Island permit does not contain any language naming member communities as co-permittees. (Page 89)

15. The Advisory Board further recommends that the MWRA increase its legal services line item by $750,000 to fund any outside counsel required to challenge the final Deer Island NPDES permit to remove co-permittee language. (Page 89)

16. The Advisory Board recommends that the MWRA staff work with Advisory Board staff to determine the best "target" level for cost-recovery of the TRAC program. Additionally, the Advisory Board recommends identifying and implementing an automatic escalator to make fee increases sustainable and predictable for the permittees. (Page 98)

17. The Advisory Board recommends reducing interest income revenue by $1.6 million. (Page 99)

18. The Advisory Board recommends establishing a HEEC Capacity Reserve fund to be used specifically for the first payments due to Eversource related to the new cross-harbor cable annual charges, mitigating a spike in community assessments as currently projected in FY21 and to:

    - Transfer the $4,419,124 originally budgeted for the cross-harbor cable protection project to this fund
    - To redirect $2,113,022 of our identified reductions to this fund (Page 108)

19. The Advisory Board recommends that the Authority continue reviewing its procurement procedures for Professional Services contracts, particularly with regard to capital projects considering the following options:

- Identify some capital project design contracts at different levels of estimated cost and complexity and conduct pilot tests of a qualifications-based selection process, and report back to the Board of Directors on the results and observations of such a pilot, its potential applications at the Authority on a limited basis, and modifications to a "pure" QBS process that might better suit the MWRA's needs
- Consider case-by-case waivers on the requirement that no other factor be weighed higher than cost
- Consider using qualifications based selections on certain projects (e.g. highly complex ones such as the Metropolitan Tunnel Redundancy) or on certain types of procurements that might increase the competition and viability of smaller design firms to participate without the onerous upfront costs of putting together a bid proposal (Page 115)

20. The Advisory Board recommends that energy efficient decorative LED lighting be installed on Deer Island, to improve the aesthetics and recognition of the Deer Island digesters as part of the Boston Harbor skyline. (Page 116)

Appendix B

List of Comments

1. The Advisory Board supports the continued use of the defeasance account strategy, which clearly identifies a use of variable rate debt service savings that is consistent with the original intended use of the funds that were raised. (Page 56)

2. The Advisory Board expects the Authority to reduce capital financing by an additional $2,190,769 to reflect the benefits of the spring 2018 defeasance transaction along with other new changes to capital financing. (Page 57)

3. The Advisory Board supports the MWRA's plan to use Pay-Go to fund its share of the new cross-harbor cable construction currently estimated at $48.25. (Page 58, Page 107)

4. The Advisory Board expects the MWRA to propose an increase of $4,522 in the "wages and salaries" category of expenses in its final FY18 CEB. (Page 62)

5. The Advisory Board supports continued funding for proposed temporary staffing related to the lead program to assist communities. (Page 63)

6. Based on new data released this spring from the GIC, MWRA projects a decrease of $414,159 from the proposed FY18 CEB. The Advisory Board expects this reduction to be included in the final FY18 CEB. (Page 63)

7. The Advisory Board expects the MWRA to reduce its overtime budget by $396,641. (Page 63)

8. The Advisory Board expects the MWRA to reduce the Watershed Reimbursement line item by $160,000. (Page 69)

9. The Advisory Board expects the MWRA to decrease its "maintenance" category of expense by $295,595 in the final FY18 CEB. (Page 75)

10. The Advisory Board expects the Authority will decrease the "other services" category of expense by $66,858. (Page 78)

11. The Advisory Board expects the Authority to decrease its FY18 CEB "utilities" expenses by an estimated $4,008,480. (Page 82)

12. The Advisory Board expects that the MWRA will increase the "chemicals" category of expense by $3,203 to reflect updated pricing and usage assumptions. (Page 85)

13. The Advisory Board expects the MWRA to request an increase of the "professional services" category of expense by $435,907 in its final budget. (Page 88)

14. The Advisory Board supports a comprehensive review of the MWRA's fleet as a good practice periodically. (Page 92)

15. The Advisory Board expects the Authority to decrease the "other materials" category of expense by $4,631. (Page 92)

Appendix B

16. The Advisory Board expects the Authority to increase "training and meetings" category of expense by $88. (Page 93)

17. The Advisory Board expects the MWRA to reduce the "other revenue" category of revenue by $299,696 to reflect updated assumptions. (Page 97)

18. The Advisory Board expects to work closely with the MWRA and all stakeholders to help MassDEP assume NPDES delegation. (Page 110)

Appendix C

IMPACTS ON RATE REVENUE REQUIREMENT	Amount
Final FY2017 RRR	$ 694,878,500
Projected FY2018 RRR	$ 721,238,000
MWRA Proposed FY18 RRR Increase	**3.79%**
AB Recommended Reductions (See Below)	$ (4,163,934)
FY2018 RRR, less changes	$ 717,074,066
Advisory Board Recommended FY18 RRR Increase	**3.19%**

IMPACTS ON EXPENDITURES	Amount	Description
MWRA ADVISORY BOARD RECOMMENDATIONS FOR FY18 CEB		
Optional Pension	$ (1,800,000)	Remove additional pension payment
Variable Rate Debt	$ (1,200,000)	Reduce variable interest rate assumption to 3.25%
Staffing (vacancy rate assumptions)	$ (1,000,000)	
Enterococcus Compliance	$ (600,000)	Assume no enterrococcus treatment for FY18
Debt Service Assistance "Pay It Forward"	$ (391,580)	FY17 DSA received and applied to FY18 assessments
AB Budget Reduction	$ (1,722)	
Legal Services	$ 750,000	Challenges to co-permittees
Short Term Investment Income	$ 1,600,000	Reducing increased revenue assumptions
HEEC Payments Fund	$ 2,113,022	To avoid rate shock in FY21
HEEC Transfer	$ 4,419,124	
Subtotal AB Recommendations	**$ 3,888,844**	
ANTICIPATED ADJUSTMENTS TO PROPOSED FY18 CEB		
Direct & Indirect Cost Changes		
Energy and Utilities	$ (4,008,480)	
Fringe Benefits	$ (414,159)	
Overtime	$ (396,641)	
Maintenance	$ (295,595)	
Watershed Reimbursement	$ (160,000)	
Other Materials	$ (4,631)	
Other Services	$ (66,858)	
Training and Meetings	$ 88	
Chemicals	$ 3,203	
Wages and Salaries	$ 4,522	
Professional Services	$ 435,907	
Subtotal of Changes to Operating Costs	**$ (4,902,644)**	
Capital Financing & Reserve Cost Changes		
Additional Defeasance Impacts		
Other Debt	$ (2,190,769)	
Subtotal of Debt & Reserve Costs	**$ (2,190,769)**	
Revenue & Income		
Other Revenue	$ (299,696)	
Investment Income		
Subtotal of Rate & Revenue	**$ (299,696)**	
OPERATING RESERVE REQUIREMENT ADJUSTMENT		
Operating Reserve Requirement	$ (1,259,061)	*Updated based on applicable adjustments; applies only to direct and indirect costs (revenue not included 5/1)*
NET CHANGES TO Proposed FY18 CEB	**$ (4,163,934)**	

Appendix D

	Total MWRA	FY17 Approved	FY18 Proposed	Change FY18 Proposed vs FY17 Approved Budget $	%
EXPENSES	Wages and Salaries	$101,858,898	$104,781,849	$2,922,950	2.9%
	Overtime	4,192,676	4,507,277	314,601	7.5%
	Fringe Benefits	20,242,323	21,515,134	1,272,811	6.3%
	Workers' Compensation	2,344,190	2,322,980	-21,210	-0.9%
	Chemicals	9,110,407	10,414,789	1,304,381	14.3%
	Energy and Utilities	21,541,078	25,750,208	4,209,130	19.5%
	Maintenance	31,080,641	32,496,380	1,415,739	4.6%
	Training and Meetings	435,481	406,181	-29,300	-6.7%
	Professional Services	6,531,939	6,685,715	153,776	2.4%
	Other Materials	6,219,630	6,697,290	477,660	7.7%
	Other Services	22,974,855	22,833,106	-141,749	-0.6%
	TOTAL DIRECT EXPENSES	**226,532,118**	**238,410,908**	**11,878,785**	**5.2%**
	Insurance	1,997,898	2,113,452	115,554	5.8%
	Watershed/PILOT	24,291,268	25,024,006	732,738	3.0%
	HEEC Payment	773,859	670,978	-102,881	-13.3%
	Mitigation	1,558,000	1,596,950	38,950	2.5%
	Addition to Reserves	-167,742	2,062,526	2,230,268	1329.6%
	Retirement Fund	4,632,624	5,077,369	444,745	9.6%
	OPEB/Additional Pension Contribution	4,876,050	5,035,422	159,372	3.3%
	TOTAL INDIRECT EXPENSES	**37,961,957**	**41,580,702**	**3,618,746**	**9.5%**
	Debt Service (before offsets)	456,003,725	469,124,310	13,120,585	2.9%
	Bond Redemption				
	Debt Service Assistance	-873,804	0	873,804	
	TOTAL DEBT SERVICE	**455,129,921**	**469,124,310**	**13,994,389**	**3.1%**
	TOTAL EXPENSES	**$719,623,996**	**$749,115,920**	**$29,491,920**	**4.1%**
REVENUE AND INCOME	Rate Revenue	694,878,500	721,238,000	26,359,500	3.8%
	Other User Charges	8,752,834	8,964,366	211,532	2.4%
	Other Revenue	6,319,171	7,658,774	1,339,603	21.2%
	Rate Stabilization	-	-	-	0.0%
	Investment Income	9,473,490	11,254,782	1,781,292	18.8%
	TOTAL REVENUE AND INCOME	**719,423,995**	**$749,115,922**	**$29,691,927**	**4.1%**

Appendix E

Cap Calculation versus Actual FY04-08 Spending

Final FY04 CIP

Baseline Cap FY04-08 ($ millions)	FY04	FY05	FY06	FY07	FY08	Total FY04-08
Projected Expenditures	$237.0	$190.2	$195.2	$217.3	$183.6	$1,023.3
Contingency	19.4	14.1	15.5	19.8	18.1	86.9
Inflation on Unawarded Construction	0.0	0.8	5.8	13.0	16.1	35.7
Less: Chicopee Valley Aqueduct Projects	(5.4)	(1.5)	(1.4)	(0.1)	(3.0)	(11.4)
FY04-08	**$250.9**	**$203.5**	**$215.2**	**$250.1**	**$214.8**	**$1,134.5**

FY08 Closeout Data

FY04-08 Actual Spending	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	Total FY04-08
Projected Expenditures	$194.0	$167.7	$152.3	$177.7	$196.8	$888.5
Contingency	0.0	0.0	0.0	0.0	0.0	0.0
Inflation on Unawarded Construction	0.0	0.0	0.0	0.0	0.0	0.0
Less: Chicopee Valley Aqueduct Projects	(0.4)	(0.5)	(2.4)	(3.3)	(1.8)	(8.4)
FY04-08	**$193.6**	**$167.2**	**$149.9**	**$174.4**	**$195.0**	**$880.1**

Change

Baseline Cap FY04-08 to Actual Spending	FY04	FY05	FY06	FY07	FY08	Total FY04-08
Projected Expenditures	($43.0)	($22.5)	($42.9)	($39.6)	$13.2	($134.8)
Contingency	(19.4)	(14.1)	(15.5)	(19.8)	(18.1)	(86.9)
Inflation on Unawarded Construction	0.0	(0.8)	(5.8)	(13.0)	(16.1)	(35.7)
Less: Chicopee Valley Aqueduct Projects	5.0	1.0	(1.0)	(3.2)	1.2	3.0
FY04-08 CAP Δ ($)	**($57.4)**	**($36.4)**	**($65.2)**	**($75.6)**	**($19.8)**	**($254.4)**
FY04-08 CAP Δ (%)	**-22.9%**	**-17.9%**	**-30.3%**	**-30.2%**	**-9.2%**	**-22.4%**

Appendix E

Cap Calculation versus
Proposed FY14 Updated Projections

Final FY09 CIP	Baseline Cap FY09-13 ($ millions)	FY09	FY10	FY11	FY12	FY13	Total FY09-13
	Projected Expenditures	$230.0	$251.7	$224.3	$196.7	$178.7	$1,081.4
	Contingency	15.6	13.8	12.0	12.1	11.4	64.8
	Inflation on Unawarded Construction	0.0	0.5	2.8	7.8	11.3	22.4
	Less: Chicopee Valley Aqueduct Projects	(1.2)	(1.9)	(9.1)	(9.5)	(2.9)	(24.8)
	FY09-13 CAP	**$244.4**	**$264.1**	**$230.0**	**$207.0**	**$198.4**	**$1,143.8**

Proposed FY14 CIP	FY09-13 Actual Spending	FY09	FY10	FY11	FY12	FY13	Total FY09-13
	Projected Expenditures	$182.2	$211.4	$139.3	$137.6	$161.9	$832.4
	Contingency	0.0	0.0	0.0	0.0	0.0	$0.0
	Inflation on Unawarded Construction	0.0	0.0	0.0	0.0	0.0	$0.0
	Less: Chicopee Valley Aqueduct Projects	(0.6)	(0.5)	(0.9)	(0.1)	0.0	($2.1)
	Projected FY14-18	**$181.6**	**$210.9**	**$138.4**	**$137.5**	**$161.9**	**$835.2**

Change	Baseline Cap FY09-13 to Actual Spending	FY09	FY10	FY11	FY12	FY13	Total FY09-13
	Projected Expenditures	($47.8)	($40.2)	($85.0)	($59.1)	($16.8)	($248.9)
	Contingency	(15.6)	(13.8)	(12.0)	(4.9)	(1.7)	(48.0)
	Inflation on Unawarded Construction	0.0	(0.5)	(2.8)	(7.8)	(11.3)	(22.4)
	Less: Chicopee Valley Aqueduct Projects	0.6	1.4	8.3	9.4	1.2	20.9
	FY09-13 CAP Δ ($)	**($62.8)**	**($53.2)**	**($91.6)**	**($69.5)**	**($31.7)**	**($308.6)**
	FY09-13 CAP Δ (%)	**-25.7%**	**-20.1%**	**-39.8%**	**-33.6%**	**-16.0%**	**-27.0%**

Appendix F

Program/Project/Subphase	Contract No.	Notice To Proceed	Substantial Completion	Total Contract Amount	Payments through FY16	Remaining Balance	FY17	FY18	FY14 - FY18
Total MWRA				7,296,484,522	3,989,048,179	3,307,436,343	142,870,027	169,503,932	613,297,221
Wastewater				3,172,494,495	1,931,262,178	1,241,232,317	73,084,692	83,174,142	351,520,357
Interception & Pumping				980,614,986	542,626,109	437,988,877	21,534,912	36,712,381	80,333,339
102 Quincy Pump Facilities	completed project			25,907,202	25,907,202	-			
104 Braintree-Weymouth Relief Facilities				234,492,623	227,704,621	6,788,001		240,899	241,588
105 New Neponset Valley Relief Sewer	completed project			30,300,304	30,300,304	-			
106 Wellesley Extension Replacement Sewer	completed project			64,358,543	64,358,543	-			
107 Framingham Extension Relief Sewer	completed project			47,855,986	47,855,986	-			
127 Cummingsville Replacement Sewer	completed project			8,998,768	8,998,768	-			
130 Siphon Structure Rehabilitation				6,880,793	939,770	5,941,023			
131 Upper Neponset Valley Sewer System	completed project			54,174,077	54,174,077	-			
132 Corrosion & Odor Control				27,879,417	3,372,834	24,506,583	535,216	1,092,705	1,999,351
136 West Roxbury Tunnel				11,313,573	10,313,573	1,000,000			
137 Wastewater Central Monitoring				27,482,036	19,782,036	7,700,000		360,000	359,835
139 South System Relief				4,939,244	3,439,244	1,500,000			
141 Wastewater Process Optimization				10,416,274	1,501,767	8,914,507			296,588
142 Wastewater Meter System - Equipment Replacement				28,437,912	5,137,912	23,300,000		512,500	512,500
143 Regional I/I Management Planning	completed project			168,987	168,987	-			
145 Facility Asset Protection				391,259,249	38,670,485	352,588,764	20,999,697	34,506,277	76,923,477
146 Deer Island Cross Harbor Tunnel				5,000,000	-	5,000,000			
147 Randolph Trunk Sewer Relief				750,000	-	750,000			
Treatment				871,835,505	266,822,001	605,013,504	22,468,263	24,369,942	128,937,436
182 Deer Island Primary and Secondary Treatment	completed project			(957,878)	(957,878)	-			
200 Deer Island Plant Optimization	completed project			33,278,598	33,278,598	-			(148,080)
206 Deer Island Treatment Plant Asset Protection				814,867,853	224,644,166	590,223,687	16,023,274	22,449,334	115,616,197
210 Clinton Wastewater Treatment Plant				22,419,257	7,629,442	14,789,815	6,444,989	1,920,608	13,469,319
211 Laboratory Services	completed project			2,227,674	2,227,674	-			
Residuals				167,642,622	64,642,623	103,000,000		2,835,243	2,942,050
261 Residuals	completed project			63,810,848	63,810,848	-			
271 Residuals Asset Protection				103,831,775	831,775	103,000,000		2,835,243	2,942,050
CSO				909,535,519	893,499,645	16,035,874	10,243,877	209,250	66,246,446
CSO MWRA Managed				433,555,016	433,388,865	166,152	166,150		3,676,538

Appendix F

Program/Project/Subphase	Contract No.	Notice To Proceed	Substantial Completion	Total Contract Amount	Payments through FY16	Remaining Balance	FY17	FY18	FY14 - FY18
339 North Dorchester Bay	completed project			221,509,794	221,509,793				(110,812)
347 East Boston Branch Sewer Relief	completed project			85,637,164	85,637,164				(8,831)
348 BOS019 Storage Conduit	completed project			14,287,581	14,287,581	-			
349 Chelsea Trunk Sewer	completed project			29,779,319	29,779,320	-			
350 Union Park Detention Treatment Facility	completed project			49,583,407	49,583,407	-			
353 Upgrade Existing CSO Facilities	completed project			22,385,200	22,385,200	-			
354 Hydraulic Relief Projects	completed project			2,294,549	2,294,549	-			
355 MWR003 Gate & Siphon				4,444,927	4,278,777	166,150	166,150		3,796,182
357 Charles River CSO Controls	completed project			3,633,077	3,633,077	-			
CSO Community Managed				424,332,383	411,907,555	12,424,828	8,667,068		62,111,187
340 Dorchester Bay Sewer Separation (Fox Point)	completed project			54,625,590	54,625,590	-			473,295
341 Dorchester Bay Sew Separation (Commercial Point)				64,173,625	60,542,452	3,631,173	(126,584)		(731,282)
342 Neponset River Sewer Separation	completed project			2,549,087	2,549,087	-			104,692
343 Constitution Beach Sewer Separation	completed project			3,731,315	3,731,315	-			(37,573)
344 Stony Brook Sewer Separation	completed project			44,246,462	44,246,463	-			48,079
346 Cambridge Sewer Separation				104,448,064	95,869,484	8,578,580	8,578,580		53,963,860
351 BWSC Floatables Controls	completed project			945,936	945,936	-			12,957
352 Cambridge Floatables Controls	completed project			1,126,708	1,126,708	-			39,783
356 Fort Point Channel Sewer Separation	completed project			11,917,090	11,917,089	-			(89,618)
358 Morrissey Boulevard Drain				32,185,790	32,188,262	(2,472)	(2,473)		(160,999)
359 Reserved Channel Sewer Separation				70,613,021	70,395,477	217,545	217,545		10,573,120
360 Brookline Sewer Separation	completed project			24,715,291	24,715,291	-			(1,282,073)
361 Bulfinch Triangle Sewer Separation	completed project			9,054,405	9,054,404	-			(803,053)
324 CSO Support				51,648,120	48,203,225	3,444,896	1,410,659	209,250	458,721
Other Wastewater				242,865,861	163,671,801	79,194,061	18,837,640	19,047,325	73,061,085
128 I/I Local Financial Assistance				242,584,985	163,390,925	79,194,061	18,837,640	19,047,325	73,061,085
138 Sewerage System Mapping Upgrades	completed project			280,876	280,876	-			
Waterworks				3,992,529,303	1,965,078,162	2,027,451,141	60,990,433	76,144,505	227,530,696
Drinking Water Quality Improvements				665,999,644	644,945,565	21,054,079	1,578,356	3,961,845	55,278,215
542 Carroll Water Treatment Plant				438,984,378	418,815,184	20,169,194	922,827	3,732,492	12,261,977
543 Brutsch Water Treatment Facility	completed project			19,972,883	19,972,879	-			7,204,637
544 Norumbega Covered Storage	completed project			106,674,147	106,674,146	-			
545 Blue Hills Covered Storage	completed project			40,082,837	40,082,837	-			120,000
550 Spot Pond Storage Facility				60,285,401	59,400,519	884,882	655,529	229,353	35,691,600

Appendix F

Program/Project/Subphase	Contract No.	Notice To Proceed	Substantial Completion	Total Contract Amount	Payments through FY16	Remaining Balance	FY17	FY18	FY14 - FY18
Transmission				2,451,652,508	770,602,308	1,681,050,201	28,197,388	24,497,036	68,258,575
597 Winsor Station Pipeline				32,877,576	2,578,137	30,299,439	1,921,238	1,478,854	4,582,638
601 Sluice Gate Rehabilitation	completed project			9,158,411	9,158,411	-			
604 MetroWest Tunnel				701,177,915	697,046,552	4,131,364	65,361	156,000	1,869,405
615 Chicopee Valley Aqueduct Redundancy	completed project			8,666,292	8,666,291	-			
616 Quabbin Transmission System				16,405,914	7,456,913	8,949,001	1,049,000		1,303,449
617 Sudbury/Weston Aqueduct Repairs				6,452,684	1,371,948	5,080,736	1,290,069	427,664	2,429,733
620 Wachusett Reservoir Spillway Improvements	completed project			9,287,460	9,287,460	-			
621 Watershed Land				24,000,000	19,277,400	4,722,600	1,580,000	1,500,000	5,015,000
622 Cosgrove Tunnel Redundancy				53,030,240	9,131,536	43,898,704	21,840,654	16,435,405	46,232,153
623 Dam Projects				4,538,205	3,115,745	1,422,460	5	515,113	545,681
625 Metropolitan Tunnel Redundancy				1,357,685,868	3,008,809	1,354,677,059	228,177	2,020,000	3,590,530
628 Metropolitan Redundancy Interim Improvements				213,371,942	503,104	212,868,838	222,884	1,350,000	2,075,988
630 Watershed Division Capital Improvements				15,000,000	-	15,000,000		614,000	614,000
Distribution And Pumping				805,461,182	400,906,743	404,554,440	23,493,407	37,630,372	89,326,945
618 Northern High NW Transmission Section 70	project eliminated from FY18 CIP			-	-	-	-	-	-
677 Valve Replacement				20,114,541	12,016,378	8,098,163			
678 Boston Low Service - Pipe & Valve Rehabilitation	completed project			23,690,863	23,690,863	-			
683 Heath Hill Road Pipe Replacement	completed project			19,358,036	19,358,036	-			
689 James L. Gillis Pump Station	completed project			33,419,007	33,419,008	-			
692 Northern High Service - Section 27 Improvement				1,133,702	123,646	1,010,055	14,310	13,196	27,506
693 NHS - Revere & Malden Pipeline Improvements				57,526,870	26,954,957	30,571,913	236,531	1,050,250	1,408,998
702 New Connecting Mains - Shaft 7 to WASM 3				37,860,699	11,315,807	26,544,892	906,100	1,143,000	2,404,100
704 Rehab of Other Pump Stations				50,257,852	30,057,852	20,200,000			
706 NHS-Connecting Mains from Section 91	completed project			2,360,194	2,360,194	-			
708 Northern Extra High Service - New Pipelines				8,045,232	3,632,119	4,413,114	20,687	36,428	57,115
712 Cathodic Protection of Distribution Mains				1,703,947	208,121	1,495,826	108,473	42,071	217,752
713 Spot Pond Supply Mains Rehab				66,927,509	63,601,327	3,326,182	2,000,532	50,000	4,669,859
714 Southern Extra High Sections 41 & 42	completed project			3,657,244	3,657,244	-			
719 Chestnut Hill Connecting Mains				33,094,496	17,486,675	15,607,821	1,000,000		1,000,000
720 Warren Cottage Line Rehab	completed project			1,204,821	1,204,821	-			
721 Southern Spine Distribution Mains				76,280,691	36,683,102	39,597,589	952	376,270	368,675
722 NIH Redundancy & Storage				105,654,814	15,344,942	90,309,873	12,015,431	17,860,063	39,246,071
723 Northern Low Service Rehab Section 8				52,677,936	2,320,986	50,356,950	13,100	900,800	913,900
725 Hydraulic Model Update	completed project			598,358	598,358	-			
727 SEH Redundancy & Storage				107,884,706	8,943,573	98,941,134	5,125,132	14,704,000	22,015,734
730 Weston Aqueduct Supply Mains				81,563,884	79,585,770	1,978,112	1,238,159	382,885	15,163,519

Program/Project/Subphase	Contract No.	Notice To Proceed	Substantial Completion	Total Contract Amount	Payments through FY16	Remaining Balance	FY17	FY18	FY14 - FY18
731 Lynnfield Pipeline	completed project			5,625,829	5,625,828	-			(51,694)
732 Walnut St. & Fisher Hill Pipeline Rehab	completed project			2,717,141	2,717,141	-			
735 Section 80 Rehabilitation				12,102,815	-	12,102,815	814,000	1,071,409	1,885,409
Other Waterworks				**69,415,968**	**148,623,546**	**(79,207,578)**	**7,721,281**	**10,055,252**	**14,666,961**
753 Central Monitoring System				39,040,065	17,804,950	21,235,115	2,674,204	1,516,464	6,191,890
763 Distribution System Facilities Mapping				2,298,919	1,036,368	1,262,551			
764 Local Water Infrastructure Rehab	completed project			7,487,762	7,487,762	-			
765 Local Water System Assistance Program				-	121,568,086	(121,568,085)	3,287,581	7,457,217	5,453,643
766 Waterworks Facility Asset Protection				20,589,222	726,381	19,862,841	1,759,496	1,081,571	3,021,429
Business & Operations Support				**131,460,724**	**92,707,839**	**38,752,885**	**8,794,902**	**10,185,285**	**34,246,168**
881 Equipment Purchase				29,187,988	18,488,576	10,699,412	2,723,113	2,210,000	11,314,361
925 Technical Assistance				1,150,000	-	1,150,000		383,333	383,333
930 MWRA Facility - Chelsea	completed project			9,813,635	9,813,635	-			
931 Business Systems Plan	completed project			24,527,709	24,527,709	-			76,479
932 Environmental Remediation	completed project			1,478,602	1,478,602	-			(200)
933 Capital Maintenance Planning & Development				15,886,005	12,543,838	3,342,168	1,683,802	1,370,804	5,474,202
934 MWRA Facilities Management				2,150,535	370,533	1,780,002			
935 Alternative Energy Initiatives				23,270,514	17,454,074	5,816,439	833,490	100,000	1,190,760
940 Application Improvement Program				9,980,394	1,476,397	8,503,997	1,180,218	2,984,227	5,567,717
942 Information Security Program (ISP)				2,821,703	1,180,838	1,640,865	273,819	665,093	1,584,560
944 Information Technology Management Program				922,640	-	922,640	727,590	165,107	892,697
946 IT Infrastructure Program				10,271,000	5,373,640	4,897,360	1,372,870	2,306,721	7,762,260

Appendix G

Overview of the FY18 Proposed CIP and Changes from the FY17 Final CIP

	FY17 Final				FY18 Proposed				Change from Final FY17			
Program and Project	**Total Budget Amount**	**FY14-18**	**FY19-23**	**Beyond 23**	**Total Budget Amount**	**FY14-18**	**FY19-23**	**Beyond 23**	**Total Budget Amount**	**FY14-18**	**FY19-23**	**Beyond 23**
Total MWRA	**7,024,072**	**661,210**	**1,176,629**	**1,498,106**	**7,296,487**	**613,299**	**1,406,314**	**1,588,753**	**272,411**	**(47,916)**	**229,687**	**90,645**
Wastewater	**3,083,688**	**363,785**	**623,868**	**360,028**	**3,172,495**	**351,519**	**775,726**	**309,246**	**88,804**	**(12,267)**	**151,858**	**(50,783)**
Interception & Pumping	**938,785**	**85,595**	**186,827**	**145,821**	**980,615**	**80,334**	**301,065**	**78,677**	**41,828**	**(5,262)**	**114,238**	**(67,145)**
102 Quincy Pump Facilities	25,907	-	-	-	25,907	-	-	-	-	-	-	-
104 Braintree-Weymouth Relief Facilities	232,455	208	4,543	-	234,493	242	6,547	-	2,038	34	2,004	-
105 New Neponset Valley Relief Sewer	30,300	-	-	-	30,300	-	-	-	-	-	-	-
106 Wellesley Extention Replacement Sewer	64,359	-	-	-	64,359	-	-	-	-	-	-	-
107 Framingham Extension Relief Sewer	47,856	-	-	-	47,856	-	-	-	-	-	-	-
127 Cummingsville Replacement Sewer	8,999	-	-	-	8,999	-	-	-	-	-	-	-
130 Siphon Structure Rehabilitation	6,669	-	5,729	-	6,881	-	5,941	-	212	-	212	-
131 Upper Neponset Valley Sewer	54,174	-	-	-	54,174	-	-	-	-	-	-	-
132 Corrosion & Odor Control	26,117	2,139	20,976	-	27,879	1,999	22,879	-	1,762	(140)	1,903	-
136 West Roxbury Tunnel	11,314	-	1,000	-	11,314	-	1,000	-	-	-	-	-
137 Wastewater Central Monitoring	27,482	375	2,910	4,415	27,482	360	3,050	4,290	-	(15)	140	(125)
139 South System Relief Project	4,939	-	1,500	-	4,939	-	1,500	-	-	-	-	-
141 Wastewater Process Optimization	10,389	297	5,168	3,719	10,416	297	5,195	3,719	27	-	27	-
142 Wastewater Meter System-Equipment	28,438	1,150	7,550	14,600	28,438	513	8,188	14,600	-	(637)	638	-
143 Regional I/I Management Planning	169	-	-	-	169	-	-	-	-	-	-	-
145 Facility Asset Protection	353,470	81,427	131,701	123,088	391,259	76,923	241,015	56,068	37,789	(4,504)	109,314	(67,020)
146 D.I. Cross Harbor Tunnel Inspection	5,000	-	5,000	-	5,000	-	5,000	-	-	-	-	-
147 Randolph Trunk Sewer Relief	750	-	750	-	750	-	750	-	-	-	-	-
Treatment	**827,737**	**139,380**	**369,635**	**133,997**	**871,836**	**128,937**	**399,026**	**159,148**	**44,099**	**(10,443)**	**29,391**	**25,151**
182 DI Primary and Secondary	**(958)**	-	-	-	(958)	-	-	-	-	-	-	-
200 DI Plant Optimization	33,279	(148)	-	-	33,279	(148)	-	-	-	-	-	-
206 DI Treatment Plant Asset Protection	772,633	126,319	365,173	133,640	814,868	115,616	393,199	158,552	42,235	(10,703)	28,026	24,912
210 Clinton Wastewater Treat Plant	20,555	13,209	4,462	358	22,419	13,469	5,827	597	1,864	260	1,365	239
211 Laboratory Services	2,228	-	-	-	2,228	-	-	-	-	-	-	-
Residuals	**167,643**	**3,302**	**9,738**	**90,067**	**167,643**	**2,942**	**17,873**	**82,291**	**-**	**(360)**	**8,135**	**(7,776)**
261 Residuals	63,811	-	-	-	63,811	-	-	-	-	-	-	-
271 Residuals Asset Protection	103,832	3,302	9,738	90,067	103,832	2,942	17,873	82,291	-	(360)	8,135	(7,776)

Appendix G

Overview of the FY18 Proposed CIP and Changes from the FY17 Final CIP

Program and Project	FY17 Final: Total Budget Amount	FY17 Final: FY14-18	FY17 Final: FY19-23	FY17 Final: Beyond 23	FY18 Proposed: Total Budget Amount	FY18 Proposed: FY14-18	FY18 Proposed: FY19-23	FY18 Proposed: Beyond 23	Change from Final FY17: Total Budget Amount	Change from Final FY17: FY14-18	Change from Final FY17: FY19-23	Change from Final FY17: Beyond 23
CSO	**906,658**	**65,970**	**2,979**	**-**	**909,535**	**66,245**	**5,582**	**-**	**2,877**	**275**	**2,603**	**-**
340 Dorchester Bay Sewer Separation (Fox Point)	54,626	473	-	-	54,626	473	-	-	-	-	-	-
341 Dorchester Bay Sewer Separation (Commercial Point)	64,174	1,650	1,376	-	64,174	(731)	3,758	-	-	(2,381)	2,382	-
342 Neponset River Sewer Separation	2,549	105	-	-	2,549	105	-	-	-	-	-	-
343 Constitution Beach Sewer Separation	3,731	(38)	-	-	3,731	(38)	-	-	-	-	-	-
344 Stony Brook Sewer Separation	44,246	48	-	-	44,246	48	-	-	-	-	-	-
346 Cambridge Sewer Separation	102,745	52,261	-	-	104,448	53,964	-	-	1,703	1,703	-	-
351 BWSC Floatables Controls	946	13	-	-	946	13	-	-	-	-	-	-
352 Cambridge Floatables Control	1,127	40	-	-	1,127	40	-	-	-	-	-	-
356 Fort Point Channel Sewer Separation	11,917	(90)	-	-	11,917	(90)	-	-	-	-	-	-
358 Morrissey Boulevard Drain	32,186	(161)	-	-	32,186	(161)	-	-	-	-	-	-
359 Reserved Channel Sewer Separation	70,749	10,709	-	-	70,613	10,573	-	-	(136)	(136)	-	-
360 Brookline Sewer Separation	24,715	(1,282)	-	-	24,715	(1,282)	-	-	-	-	-	-
361 Bulfinch Triangle Sewer Separation	9,054	(803)	-	-	9,054	(803)	-	-	-	-	-	-
339 North Dorchester Bay	221,600	(21)	-	-	221,510	(111)	-	-	(90)	(90)	-	-
347 East Boston Branch Sewer Relief	85,637	(9)	-	-	85,637	(9)	-	-	-	-	-	-
348 BOS019 Storage Conduit	14,288	-	-	-	14,288	-	-	-	-	-	-	-
349 Chelsea Trunk Sewer	29,779	-	-	-	29,779	-	-	-	-	-	-	-
350 Union Park Detention Treatment Facility	49,583	-	-	-	49,583	-	-	-	-	-	-	-
353 Upgrade Existing CSO Facilities	22,385	-	-	-	22,385	-	-	-	-	-	-	-
354 Hydraulic Relief Projects	2,295	-	-	-	2,295	-	-	-	-	-	-	-
355 MWR003 Gate & Siphon	4,445	3,796	-	-	4,445	3,796	-	-	-	-	-	-
357 Charles River CSO Controls	3,633	-	-	-	3,633	-	-	-	-	-	-	-
324 CSO Support	50,248	(720)	1,604	-	51,648	459	1,825	-	1,400	1,179	221	-
Other Wastewater	**242,866**	**69,538**	**54,689**	**(9,857)**	**242,866**	**73,061**	**52,180**	**(10,870)**	**-**	**3,523**	**(2,509)**	**(1,013)**
128 I/I Local Financial Assistance	242,585	69,538	54,689	(9,857)	242,585	73,061	52,180	(10,870)	-	3,523	(2,509)	(1,013)
138 Sewerage System Mapping Upgrade	281	-	-	-	281	-	-	-	-	-	-	-
Total Waterworks	**3,806,266**	**258,415**	**535,095**	**1,138,079**	**3,992,531**	**227,533**	**610,818**	**1,279,510**	**186,265**	**(30,884)**	**75,721**	**141,428**
Drinking Water Quality	**664,361**	**56,661**	**11,857**	**637**	**665,999**	**55,279**	**5,097**	**10,417**	**1,638**	**(1,382)**	**(6,760)**	**9,780**
542 Carroll Water Treatment Plant	436,904	13,599	11,460	637	438,984	12,262	5,097	10,417	2,080	(1,337)	(6,363)	9,780
543 Quabbin Water Treatment Plant	19,973	7,205	-	-	19,973	7,205	-	-	-	-	-	-
544 Norumbega Covered Storage	106,674	-	-	-	106,674	-	-	-	-	-	-	-
545 Blue Hills Covered Storage	40,557	198	397	-	40,083	120	-	-	(474)	(78)	(397)	-
550 Spot Pond Storage Facility	60,253	35,659	-	-	60,285	35,692	-	-	32	33	-	-

Appendix G

Overview of the FY18 Proposed CIP and Changes from the FY17 Final CIP

Program and Project	FY17 Final				FY18 Proposed				Change from Final FY17			
	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23	Total Budget Amount	FY14-18	FY19-23	Beyond 23
Transmission	**2,291,472**	**81,970**	**364,993**	**1,089,470**	**2,451,654**	**68,261**	**352,983**	**1,275,377**	**160,182**	**(13,711)**	**(12,012)**	**185,904**
597 Winsor Station Pipeline	31,177	5,522	24,260	-	32,878	4,583	23,838	3,061	1,701	(939)	(422)	3,061
601 Sluice Gate Rehabilitation	9,158	-	-	-	9,158	-	-	-	-	-	-	-
604 MetroWest Tunnel	707,447	2,007	9,923	118	701,178	1,869	3,910	-	(6,269)	(138)	(6,013)	(118)
615 Chicopee Valley Aqueduct Redundancy	8,666	-	-	-	8,666	-	-	-	-	-	-	-
616 Quabbin Transmission System	15,957	1,254	7,500	-	16,406	1,303	7,900	-	449	49	400	-
617 Sudbury/Weston Aqueduct Repairs	6,553	2,548	3,345	-	6,453	2,430	3,363	-	(100)	(118)	18	-
620 Wachusett Reservior Spillway Improvement	9,287	-	-	-	9,287	-	-	-	-	-	-	-
621 Watershed Land	24,000	6,658	-	-	24,000	5,015	1,643	-	-	(1,643)	1,643	-
622 Cosgrove/Wachusett Redundancy	-	-	-	-	53,030	46,232	5,621	1	53,030	46,232	5,621	1
623 Dam Projects	4,538	546	907	-	4,538	546	907	-	-	-	-	-
625 Metro Tunnel Redundancy	1,474,687	63,435	319,058	1,089,353	1,357,686	3,591	151,111	1,201,319	(117,001)	(59,844)	(167,947)	111,966
628 Metro Redundancy Interim Improvements					213,372	2,076	140,302	70,994	213,372	2,076	140,302	70,994
630 Watershed Division Capital Improvements					15,000	614	14,386	-	15,000	614	14,386	-
Distribution & Pumping	**779,782**	**108,445**	**169,566**	**129,070**	**805,462**	**89,327**	**179,168**	**164,268**	**25,680**	**(19,118)**	**9,602**	**35,198**
618 Northern High NW Tran Sections 70 & 71	1,000	474	526	-	-	-	-	-	(1,000)	(474)	(526)	-
677 Valve Replacement	22,749	2,153	4,183	4,397	20,115	-	3,558	4,540	(2,634)	(2,153)	(625)	143
678 Boston Low Service-Pipe & Valve Rehabilitation	23,691	-	-	-	23,691	-	-	-	-	-	-	-
683 Heath Hill Road Pipe Replacement	19,358	-	-	-	19,358	-	-	-	-	-	-	-
689 James L. Gillis Pump Station Rehabilitation	33,419	-	-	-	33,419	-	-	-	-	-	-	-
692 NHS - Section 27 Improvements	1,097	183	790	-	1,134	28	983	-	37	(155)	193	-
693 NHS - Revere & Malden Pipeline Improvement	55,010	814	27,363	-	57,527	1,409	29,285	-	2,517	595	1,922	-
702 New Connect Mains-Shaft 7 to WASM 3	36,255	2,559	22,638	97	37,861	2,404	21,907	2,589	1,606	(155)	(731)	2,492
704 Rehabilitation of Other Pump Stations	55,058	253	5,868	18,879	50,258	-	1,321	18,879	(4,800)	(253)	(4,547)	-
706 NHS-Connecting Mains from Section 91	2,360	-	-	-	2,360	-	-	-	-	-	-	-
708 Northern Extra High Service New Pipelines	7,889	59	3,498	701	8,045	57	3,599	757	156	(2)	101	56
712 Cathodic Protection Of Distrubution Mains	1,656	418	1,097	-	1,704	218	1,345	-	48	(200)	248	-
713 Spot Pond Supply Mains Rehabilitation	68,810	4,564	3,214	50	66,928	4,670	1,276	-	(1,882)	106	(1,938)	(50)
714 Southern Extra High Sections 41 & 42	3,657	-	-	-	3,657	-	-	-	-	-	-	-
719 Chestnut Hill Connecting Mains	24,450	1,000	102	5,861	33,094	1,000	14,602	6	8,644	-	14,500	(5,855)
720 Warren Cottage Line Rehabilitation	1,205	-	-	-	1,205	-	-	-	-	-	-	-
721 South Spine Distribution Mains	74,985	369	3,964	33,961	76,281	369	4,042	35,179	1,296	-	78	1,218
722 NIH Redundancy & Storage	92,641	46,523	40,144	-	105,655	39,246	37,453	22,982	13,014	(7,277)	(2,691)	22,982
723 Northern Low Service Rehabilitation Section 8	23,441	44	20,036	1,041	52,678	914	27,730	21,715	29,237	870	7,694	20,674
724 Northern High Service - Pipeline Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-
725 Hydraulic Model Update	598	-	-	-	598	-	-	-	-	-	-	-
727 Southern Extra High Redundancy & Storage	101,694	31,452	8,866	54,619	107,885	22,016	22,459	56,653	6,191	(9,436)	13,593	2,034
730 Weston Aqueduct Supply Mains	109,811	16,679	18,209	8,879	81,564	15,164	357	-	(28,247)	(1,515)	(17,852)	(8,879)
731 Lynnfield Pipeline	5,626	(52)	-	-	5,626	(52)	-	-	-	-	-	-
732 Walnut St. & Fisher Hill Pipeline Rehabilitation	2,717	-	-	-	2,717	-	-	-	-	-	-	-

Appendix G

Overview of the FY18 Proposed CIP and Changes from the FY17 Final CIP

Program and Project	FY17 Final Total Budget Amount	FY17 Final FY14-18	FY17 Final FY19-23	FY17 Final Beyond 23	FY18 Proposed Total Budget Amount	FY18 Proposed FY14-18	FY18 Proposed FY19-23	FY18 Proposed Beyond 23	Change from Final FY17 Total Budget Amount	Change from Final FY17 FY14-18	Change from Final FY17 FY19-23	Change from Final FY17 Beyond 23
733 NHS Pipeline Rehabilitation 13-18 & 48	-	-	-	-	-	-	-	-	-	-	-	-
734 Southern Extra High Pipelines-Sections 30, 39,40, & 44	-	-	-	-	-	-	-	-	-	-	-	-
735 Section 80 Rehabilitation	10,606	954	9,067	585	12,103	1,885	9,250	968	1,497	931	183	383
Other	**70,651**	**11,339**	**(11,321)**	**(81,100)**	**69,416**	**14,666**	**73,570**	**(170,554)**	**(1,235)**	**3,327**	**84,891**	**(89,454)**
753 Central Monitoring System	39,215	6,458	6,268	10,686	39,040	6,192	6,277	10,767	(175)	(266)	9	81
763 Distribution Systems Facilities Mapping	2,299	533	730	-	2,299	-	1,263	-	-	(533)	533	-
764 Local Water Infrastructure Rehabilitation Assistance	7,488	-	-	-	7,488	-	-	-	-	-	-	-
765 Local Water Pipeline Improvement Loan Program	-	1,797	(34,144)	(94,512)	-	5,454	49,770	(182,083)	-	3,657	83,914	(87,571)
766 Waterworks Facility Asset Protection	21,649	2,552	15,825	2,726	20,589	3,021	16,260	762	(1,060)	469	435	(1,964)
Business & Operations Support	**134,119**	**39,010**	**17,667**	**-**	**131,461**	**34,245**	**19,775**	**-**	**(2,658)**	**(4,765)**	**2,108**	**-**
881 Equipment Purchase	28,937	11,633	5,197	-	29,188	11,314	5,766	-	251	(319)	569	-
925 Technical Assistance	1,125	775	350	-	1,150	383	767	-	25	(392)	417	-
930 MWRA Facility - Chelsea	9,814	-	-	-	9,814	-	-	-	-	-	-	-
931 Business Systems Plan	24,528	76	-	-	24,528	76	-	-	-	-	-	-
932 Environmental Remediation	1,479	-	-	-	1,479	-	-	-	-	-	-	-
933 Capital Maintenance Planning	16,337	6,212	-	-	15,886	5,474	288	-	(451)	(738)	288	-
934 MWRA Facilities Management	2,151	-	1,780	-	2,151	-	1,780	-	-	-	-	-
935 Alternative Energy Initiatives	25,558	2,662	5,699	-	23,271	1,191	4,883	-	(2,287)	(1,471)	(816)	-
940 Applicat Improv Program	10,176	6,881	3,222	-	9,980	5,568	4,340	-	(196)	(1,313)	1,118	-
942 Info Security Program ISP	2,822	1,885	402	-	2,822	1,585	702	-	-	(300)	300	-
944 Info Tech Mgmt Program	923	893	30	-	923	893	30	-	-	-	-	-
946 IT Infrastructure Program	10,271	7,994	986	-	10,271	7,762	1,218	-	-	(232)	232	-

Appendix H

New Capital Projects Added to the FY18 CIP

Project	Program	Project	Subphase	Contract Number	Total Contract Amount	FY18	FY14-18	FY19-23	Beyond FY23	Total Expenditures
1	Interception & Pumping	Corrosion & Odor Control	Nut Island Headworks Odor Control and HVAC Improvements Construction	7548	$ 10,000,000		$ -	$ 10,000,000	$ -	$ 10,000,000
2	Interception & Pumping	Facility Asset Protection	Fuel Oil Tank Replacements at Various Facilities Design CA/RI	7553	$ 1,528,605	$ 286,614	$ 286,614	$ 1,241,991		$ 1,528,605
	Interception & Pumping	Facility Asset Protection	Fuel Oil Tank Replacements at Various Facilities Construction Phase 1	7554	$ 3,566,745		$ -	$ 3,566,745		$ 3,566,745
	Interception & Pumping	Facility Asset Protection	Fuel Oil Tank Replacements at Various Facilities Construction Phase 2	7555	$ 2,547,675		$ -	$ 2,547,675		$ 2,547,675
3	Interception & Pumping	Facility Asset Protection	Headworks Effluent Shaft Rehabilitation Design CA/RI	7549	$ 2,038,140		$ -	$ 2,038,140		$ 2,038,140
	Interception & Pumping	Facility Asset Protection	Headworks Effluent Shaft Rehabilitation Construction	7550	$ 10,190,700		$ -	$ 10,190,700		$ 10,190,700
4	Interception & Pumping	Facility Asset Protection	Wiggins Terminal Pump Station Replacement Design CA/RI	7551	$ 508,855	$ 80,955	$ 80,955	$ 427,900		$ 508,855
	Interception & Pumping	Facility Asset Protection	Wiggins Terminal Pump Station Replacement ConstructionI	7552	$ 2,035,420		$ -	$ 2,035,420		$ 2,035,420
5	Treatment	DITP Asset Protection	Fixed Gas Protection Systems Replacement	7167	$ 2,000,000	$ 166,667	$ 166,667	$ 1,833,333		$ 2,000,000
6	Residuals	Residuals Asset Protection	Residuals Pellet Conveyance Piping	7173	$ 3,000,000	$ 166,667	$ 166,667	$ 2,833,333		$ 3,000,000
7	Distribution and Pumping	Northern Low Service - Section 8	Section 57 Water Pipeline and Sect. 21/20/19 Sewer Rehab Design/ESDC/REI	7540	$ 4,800,000	880,000	$ 880,000	$ 3,920,000		$ 4,800,000
	Distribution and Pumping	Northern Low Service - Section 8	Section 57 Water Pipeline and Sect. 21/20/19 Sewer Rehab Construction	7541	$ 22,272,000		$ -	$ 22,272,000		$ 22,272,000
8	Transmission	Metropolitan Redundancy Interim Improvements	Metropolitan Redundancy Interim Improvements Design CA/RI	7560	$ 10,414,895	150,000	$ 150,000	$ 9,412,000	$ 852,895	$ 10,414,895
	Transmission	Metropolitan Redundancy Interim Improvements	Tops of Shafts Interim Improvements Construction	7561	$ 6,114,420		$ -	$ 6,114,420		$ 6,114,420
9	Transmission	Metropolitan Redundancy Interim Improvements	Chestnut Hill Emergency Pump Station Improvements Construction	7562	$ 18,343,260		$ -	$ 18,343,260		$ 18,343,260
10	Transmission	Metropolitan Redundancy Interim Improvements	WASM/Spot Pond Supply Mains West PRV Improvements Construction	7563	$ 8,152,560		$ -	$ 8,152,560		$ 8,152,560
11	Transmission	Watershed Improvements	Quabbin Admin Building Rehabilitation Design CA/RI	7564	$ 3,000,000	614,000	$ 614,000	$ 2,386,000		$ 3,000,000
	Transmission	Watershed Improvements	Quabbin Admin Building Rehabilitation Construction	7565	$ 12,000,000			$ 12,000,000		$ 12,000,000
	SUMMARY:									
	Total Wastewater Projects				**$ 37,416,140**	**$ 700,903**	**$ 700,903**	**$ 36,715,237**	**$ -**	**$ 37,416,140**
	Total Waterworks Projects				**$ 85,097,135**	**$ 1,644,000**	**$ 1,644,000**	**$ 82,600,240**	**$ 852,895**	**$ 85,097,135**
	Total Projects				**$ 122,513,275**	**$ 2,344,903**	**$ 2,344,903**	**$ 119,315,477**	**$ 852,895**	**$ 122,513,275**

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WAKEFIELD	Paul R. Dinocco	Carol Antonelli*/Richard Stinson
WALPOLE	Eric A. Kraus	Patrick Fasanello
WALTHAM	Hon. Jeannette A. McCarthy	
WATERTOWN	Francis J. Golden	Gerald Mee
WELLESLEY	David C. Chapin	Walter Woods*
WESTON	Doug Gillespie	
WESTWOOD	John M. hickey	Jeffrey Bina
WEYMOUTH	Hon. Robert L. Hedlund	Kenan J. Connell/Kenneth Morse
WILBRAHAM	Susan C. Bunne	
WILMINGTON	Michael Champoux	Michael Woods/Joseph Lobao
WINCHESTER	Lance Grenzeback	James Gibbons
WINTHROP	Robert L. Driscoll	Thomas E. Reilly
WOBURN	Hon. Scott Galvin	Anthony Blazejowski
WORCESTER	Hon. Joseph M. Petty	

*Member of the Executive Committee
** Chairman of the Executive Committee

Gubernatorial Appointees
Quabbin and Ware Watershed –J. R. Greene
Wachusett Watershed – Barbara Wyatt
Environmental Protection –
Andrew Chalker Fisk
Connecticut River Basin –
Richard N. Palmer
Boston Harbor – Vacant (2)

MAPC Appointee:
Edward G. Bates

Advisory Board Designees to the MWRA Board of Directors:

John Carroll – Norwood
Andrew Pappastergion - Brookline
Joseph Foti - Chelsea